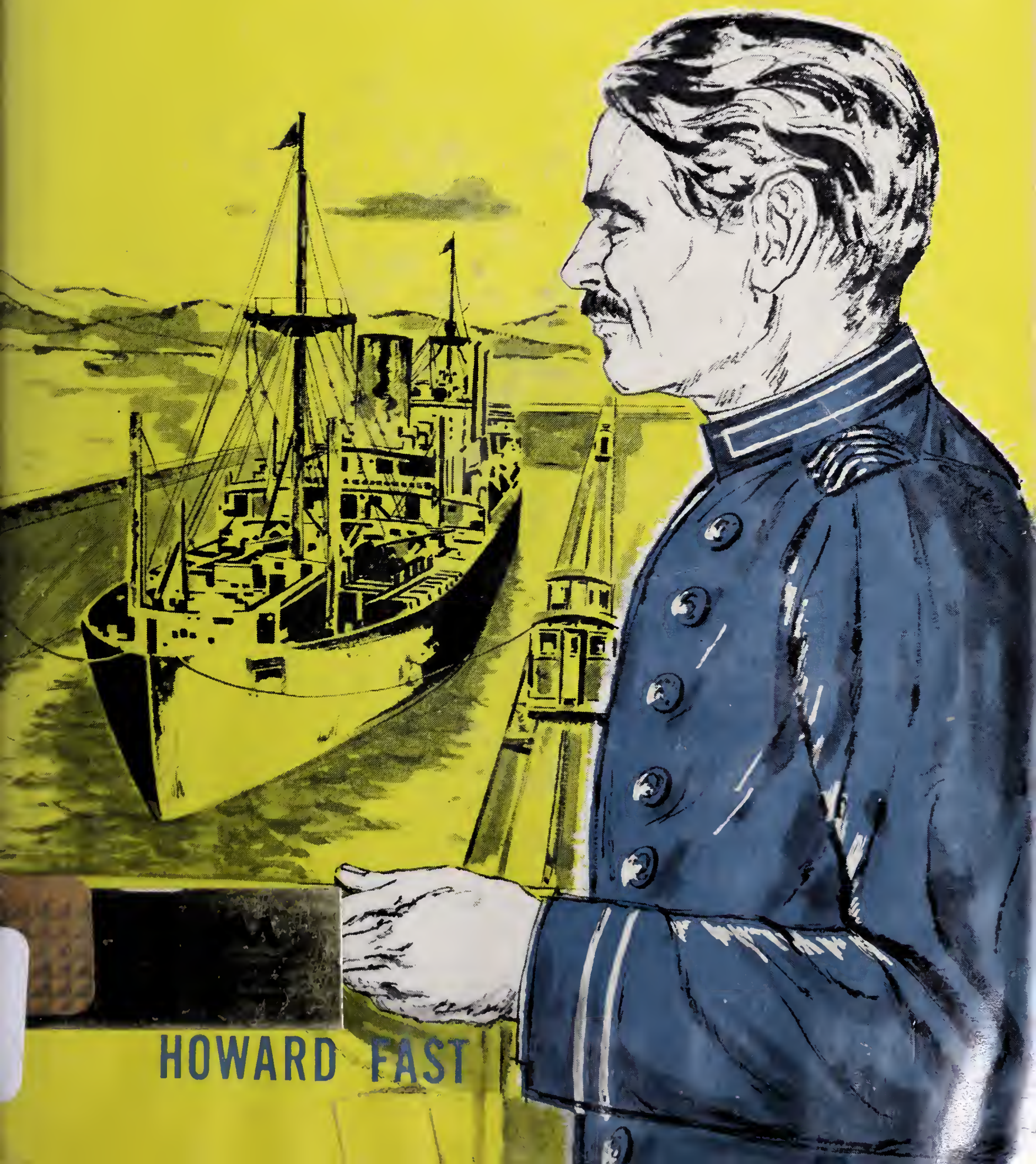
GOETHALS
and the
PANAMA CANAL



HOWARD FAST

GOETHALS
and the
PANAMA CANAL
by Howard Fast

From the time when the first faint whisperings of a new world came to the ears of Europe, man began to dream of a westward passage through the great land masses of North and South America. After many centuries, their dream came true in the mighty engineering work called the Panama Canal.

Here is the story of Panama, the Canal, and of the man who built it—a great story of adventure and adventurers. As told by Howard Fast, it becomes the saga of the men who went down to the Isthmus to conquer it: explorers, Spanish Dons, pirates, gold hunters, and lastly, engineers. How they fought and worked and dreamed, and how finally their dreams came true in the completed "big ditch" makes as fascinating a tale as any piece of fiction.

Every detail of the Canal is simply explained, and a hundred mysteries are cleared up, such as how a ship is lifted over the mountains from ocean to ocean.

The chief character is George Washington Goethals, who supervised the building of the Canal, and while the book covers his childhood and later years, it deals particularly with Goethals' culminating achievement—his work on the Panama Canal.

Today, when the Panama Canal is on everyone's lips, this book will have more than ordinary interest. No one can realize the full importance of the Canal who does not know what went into the making of it.

Illustrated by Rafaello Busoni

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Goethals

AND THE PANAMA CANAL

The story of Panama, the Canal, and of the man who built it—a great story of adventure and adventurers—how they fought and worked and dreamed, and how finally their dreams came true in the completed "big ditch." The chief character is George Washington Goethals, who supervised the building of the Canal, and while the book covers his childhood and later years, it deals particularly with Goethals' culminating achievement—his work on the Panama Canal.

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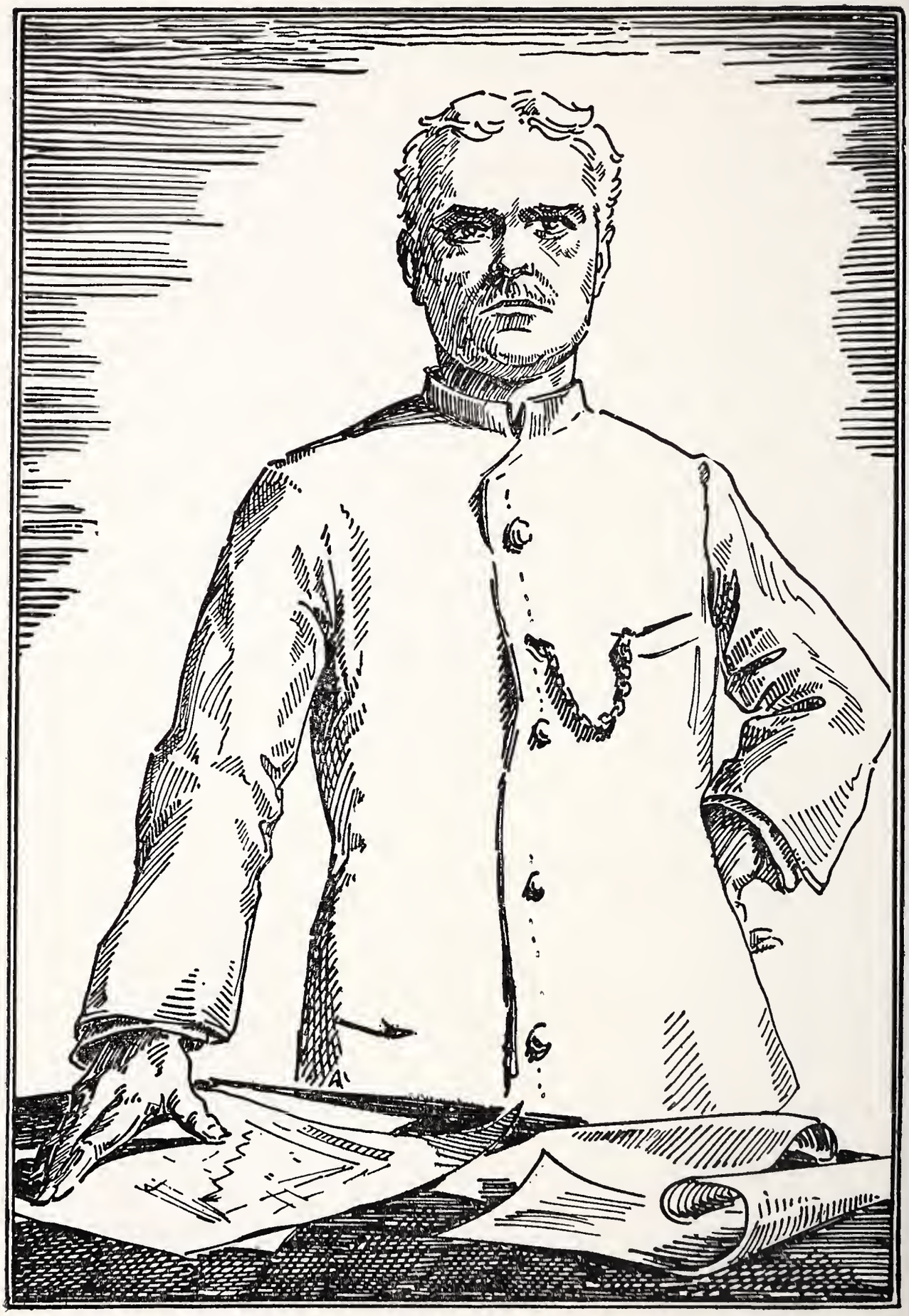

George Washington Goethals

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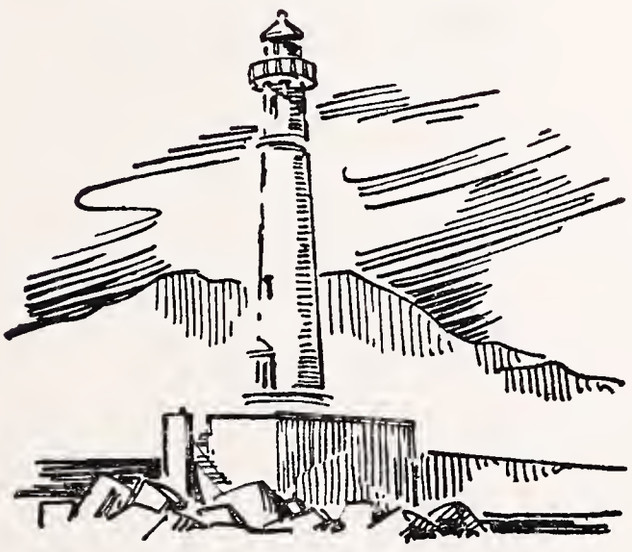
GOETHALS *and the* PANAMA CANAL

By HOWARD FAST



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FOR MY FATHER

A man went down to Panama

Where many a man had died

To slit the sliding mountains

And lift the eternal tide:

A man stood up in Panama,

And the mountains stood aside.

—Percy MacKaye

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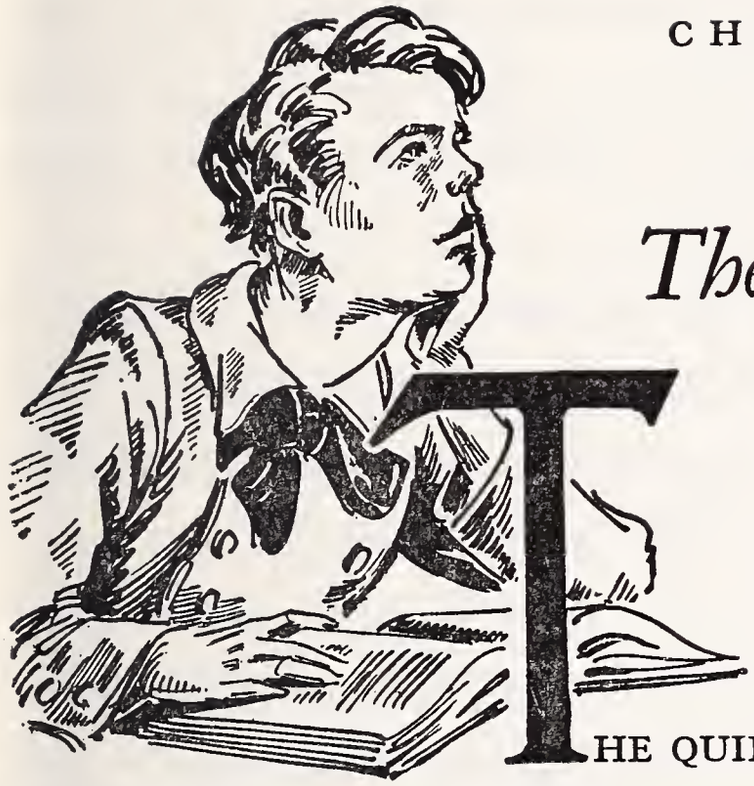
Goethals
AND THE PANAMA CANAL



CHAPTER ONE

The Engineer

THE QUIET, BLUE-EYED BOY WAS not given to boasting. His inclination to sit and dream sometimes worried his parents and sometimes prompted other boys to poke fun at him. And then his answers, in a slow, liquid drawl, sent them into gales of laughter. There was no other drawl like that in Brooklyn.

The boys would say, "You're not in Dixie, Dutch."

He hated to be called Dutch. A steely glint would come into his blue eyes. "I'm not Dutch," he might say very quietly.

He was not given to boasting. His parents were Flemish, out of Belgium, but he didn't consider it worth thinking about. His name was George Washington Goethals, and he was American, and that was enough for

him. There was enough for him to boast about, had e desired to.

If they made fun of his name and asked him when e was going to cross the Delaware, that same steely gl:t came into his eyes. "It's good enough for me," he wou say, in that slow, curious drawl—the origin of whih bewildered even his parents.

Usually they would leave him alone when that lok came into his face. He was big and slow-moving fora boy of ten, but there seemed to be a dynamic pow underneath that even children could recognize.

He himself was proud of his name. It had meanir His parents had called him George Washington out f love and affection for this new land they had made thr own.

It was better than having a name that was just a nam like John or Arthur or Sam. His name *was* somethi and it meant something. So let them make a joke of i; to him it would never be a joke, but something to e proud of.

As for his other name, Goethals, there was somethi of which he could have boasted, too, had he been given boasting. But he had an instinctive knowledge that this land such things did not matter and should nt matter. It was enough that he should be simply the son f John and Marie Goethals, who had come from Flande to this country, seeking a better way of life.

However, he had a book which told of that other ame, Goethals, and what it meant. The book was ritten by a man called Schellinck, and the name of the ook was the *Goethals Chronicles*. It was the story of all ie Goethals for a thousand years back, and though he ould not read the strange language in which it was ritten, young George knew most of the stories it told.

There were never more wonderful stories than that ook held, stories of knights and crusaders and judges nd scholars, all of them bearing the name of Goethals nd somehow connected with the simple carpenter who as George's father.

George never felt any need or desire to boast about hat was in that book, but it was comforting to dream bout all the great men who had borne his name.

* * *

In the year 1848 there was a great wave of emigration rom Europe to America. People left Europe by the housands and poured into America. They sought, most f them, one thing—freedom.

This is how that came about. For many hundreds of ears, these people of Europe, who were poverty-stricken, ad been oppressed by their rulers. But as the Dark Ages assed, they began to talk of freedom and liberty. In rance and England and America there were revolu- ions, and from those places the spirit of freedom spread

to all of Europe. And in the year 1848 uprisings brok out in almost every country in Europe.

Most of these revolutions were not successful, but the gave people a taste of liberty they would not soon forge And having failed, so many of them, in their own cou try, they turned their faces to America. That is why, i 1848, so many thousands of people left Europe and saile for America.

Among those thousands was a Belgian woodworke John Goethals by name. In America, John Goethals ma ried a country woman of his, Marie Baron, and the settled down in Brooklyn to raise a family. John Goethal took out citizenship papers. He loved America, and h was satisfied that it was the best place in the world for man to be.

In 1856 his first child was born, a boy he called Johr But when the second child was born two years later, an

other boy, John and Marie Goethals decided that nothing else would do but to give him that best of American names, George Washington.

George Washington Goethals. They were proud of the boy and just as proud of the name. How could he help but do great things with such a name to help him along?

George grew up into a quiet, thoughtful boy. He preferred listening to talking, and very often he preferred the world of books to the more apparent world around him. He was always big for his age, somewhat self-conscious of his fair hair and his very blue eyes.

The Goethals family lived in Brooklyn until George was eleven, and then they moved to number 47 Avenue D, on the East Side of New York. The East Side had not yet become the turbulent slum area it was to be later. Number 47 was in a quiet residential neighborhood, a place that fitted in well with George's thoughtful, almost dreamy youth.

* * *

Thus our story of a ditch, a huge ditch, a fantastic ditch, a ditch to dwarf all seven wonders of the world, and of the man who dug that ditch, begins. It is the story of an engineer who quietly performed the greatest feat of engineering the world had known up to his time.

Today this ditch and the wonderful locks that lift great ocean liners over mountains are known as the

Panama Canal. And when one speaks of the Panama Canal, in the same breath one mentions George Washington Goethals, its builder.

To Goethals, building the Panama Canal was only one job in a long, rich life that was filled with many hard jobs. For us, it is part of the security of the United States, part of our heritage of democracy and freedom. And for the whole of the civilized world, it is the gift of a man of genius, an everlasting miracle.

This is the story of the canal, of why it was built and how it was built—and thus the story of Goethals, the builder, the man who went down to Panama.

* * *

Young George, at a very early age, made up his mind to plan his life. While still in grammar school, though he didn't know exactly what he wanted to do, he had already made up his mind what he didn't want to do.

He had seen his older friends drift from one thing to another, planning nothing, falling by chance into any notch that came their way. He didn't want that; he wanted a profession, medicine, law, or—and this more than anything—engineering.

He lived in a world of structures, cobbled streets, stone houses; already little old New York was reaching for the sky. Men were building, everywhere, and building fascinated him. If a man could take stone and steel and

ake something new and wonderful out of it, what more uld he desire?

Though going to school, George Goethals found time work. Work was not difficult for a boy to find in New ork of the early Seventies. The city was expanding with ips and bounds, rapidly becoming the commercial nter of the world. But as yet there were no telephones—hich meant that all messages between the various busi-ss houses had to be delivered by messenger.

George discovered that he could always find work as a essenger. Messengers were in demand, and hundreds of ys made spare-time money that way. And, as George ticed, the boys either slipped into messenger jobs and yed there or became assistant bookkeepers and then okkeepers. For seven or eight dollars a week, these ter then spent their days on a high stool, bent over a l-topped desk.

He conceived a horror of such an existence. It was finitely one of the things he did not want, and as in-ance against it, he began to save money for his higher ication. He took part-time jobs wherever he could find m, office boy, assistant bookkeeper, addresser—and h job strengthened his determination not to fall into h a groove.

With the part-time work, he kept his marks up and l no difficulty in passing the entrance examinations the College of the City of New York. And at City

College, where good scholarship was no novelty, he st
ranked high. For three years, George studied at City Co-
lege; then during his fourth year, fate intervened to st
him on the road that led to Panama.

News came to the college that there was a vacancy f
an appointment to West Point. The congressman of th
district had already selected a candidate, but the a-
pointee had failed in the competitive examinatior
Therefore the place was open—and the news set George
heart beating faster.

Nathan P. Beer was the principal of the gramm
school George had attended. For many years he had fo-
lowed George's career, watching the hard, even pe-
sistence of the boy, and knowing how much he wanted
good education and a profession—preferably enginee-
ing. Now, when Beer heard of the vacancy at West Poir
his first thought was of Goethals.

"Would you want it?" he asked George. "You knov
it's about the best training an engineer can have, for
years at the Point."

George held his breath, scarcely daring to hope, ar
Mr. Beer went to work. First he obtained the quick a
proval of President Webb of City College, an old We
Pointer himself, and then he proceeded to interview th
congressman, Samuel S. Cox, in whose district th
vacancy had occurred.

"I was going to hold competitive examinations," Cox protested to Beer's enthusiasm.

"When you can have a boy like this?" Beer spread George's records for the congressman to see.

"It's impressive," Cox admitted. "But what makes you so sure he should go to the Point?"

"Because I want to do the Point a favor." Beer smiled. "You think a lot of the boy."

"And a good many other people are going to think a lot of him," Beer said. "This is his chance. He's worked hard for it and he deserves it. I want you to give it to him."

Cox agreed. He decided that George should have his chance for West Point without any sort of competitive examinations if a guarantee would be given that once at West Point he would remain there until he graduated.

Previous to the West Point opportunity, George had considered, for a time, going into medicine, with an eye on surgery. Even in medicine, his main desire was to build and create. But already the task of holding jobs to pay his way while he attended City College was proving most difficult. Under the strain, his health was beginning to break down. Could he continue this through the years necessary for professional training?

"You owe it to yourself to go to West Point," President Webb told him.

That was enough encouragement for George. The ste was taken and thoughts of medicine were put away. H would go to West Point and he would be an enginee

* * *

Four years followed, four years of hard work mixe strangely enough, with a good deal of enjoyment. For i spite of the legendary hardships of West Point in th Seventies, Cadet Goethals enjoyed himself thorough and managed to graduate without any demerits bein scored against him.

West Point was not a picnic, and the achievement a cadet going through four years of it without demer was very rare. Nor was Goethals a prig; he did his wor and he enjoyed it, and more than anything he toc pleasure in the knowledge that he was becoming a ful fledged engineer.

Graduated from West Point with honors, Second Lie tenant Goethals called upon Congressman Cox to than him. Cox was impressed with his tall, light-haired pr tégé, and would have nothing else but that he must gi the lieutenant a letter of introduction to General Willia Tecumseh Sherman.

Goethals was embarrassed. Sherman, at that time, w at the head of the U.S. Army. "Please, sir," he said, "ho can I presume on the commander in chief?"

"Nonsense, not at all," Cox reassured him. "I'll give ou the letter."

Somehow Goethals gathered the courage to present the :tter to the commander in chief in person.

Sherman asked him, "What branch of the service did ou select, Lieutenant?"

The story goes that Goethals answered, "The engineers, sir."

"The engineers!" sniffed Sherman. "However, in spite f that, I hope that you may do some good for your coun-:y someday."

Sherman could not foresee that the young engineer was) fight one of the greatest battles in all history, not gainst men with death and desolation as its outcome, but gainst fever and swamp and quicksand and rock, to let ıe waters of one ocean pour into another.

* * *

During the summer and autumn after his graduation 'om West Point, George Goethals served as assistant in-ructor of Astronomy at the Academy. Meanwhile he 'etted for an opportunity to try his hand at some prac-cal engineering. But it was to be two years before he 'ould have a chance at a job all his own.

When his period of tutoring at the Academy was over ı October, he was shifted to Willets Point, New York,

where he became a student officer at the Engineer Schoo of Application.

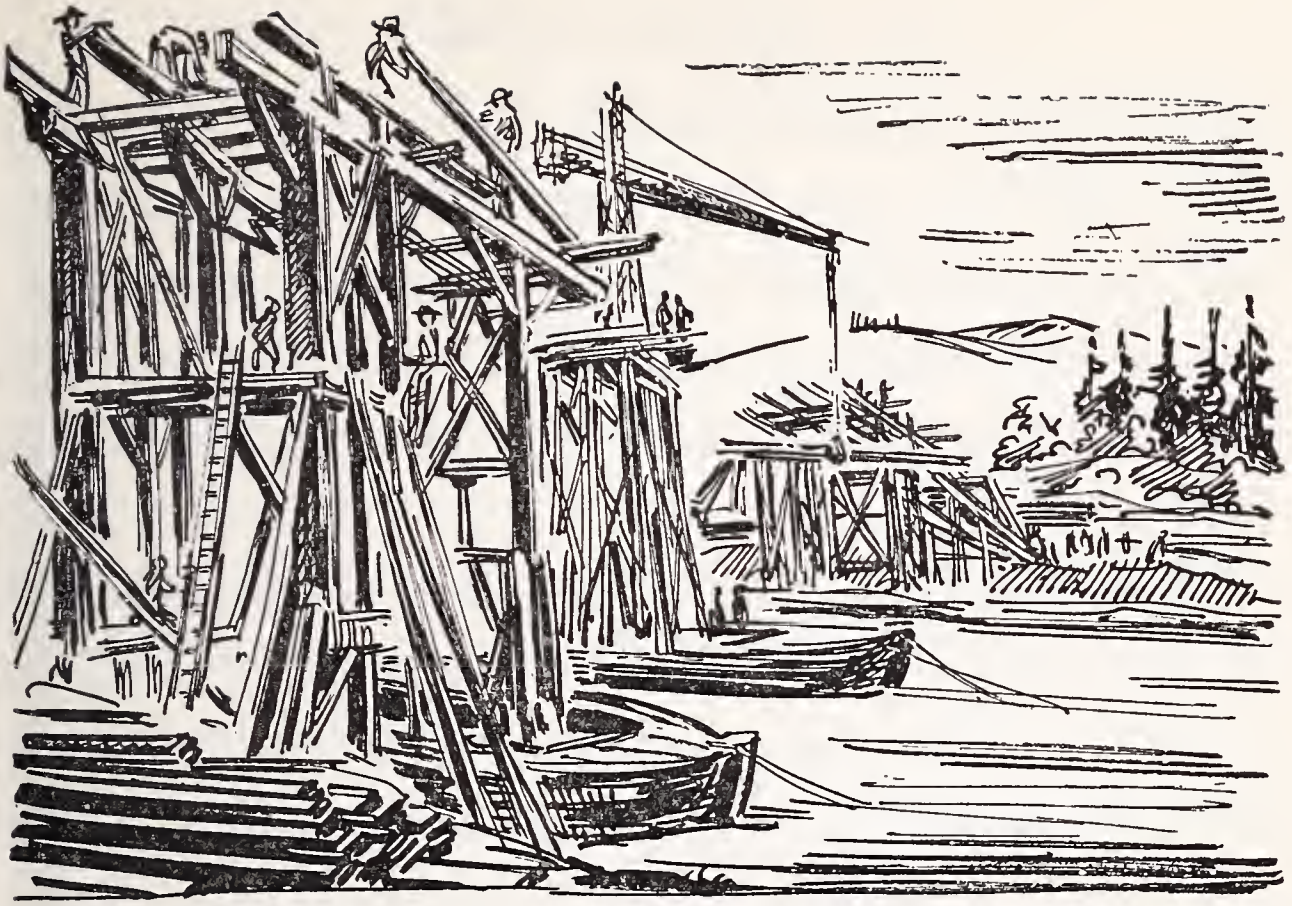
He spent two years there on theory, while he learnec to build a bridge, pour a dam, lay down a road or sink a shaft. As usual, he had no trouble getting along with hi brother officers. He was popular, well liked everywher he went. Whether it was for a sing, where a good teno voice was needed, or to fill in at a dinner, or to make u a party to go to New York, George was always i demand.

For all his impatience, the two years passed quickl enough, whereupon he went out into the field. His firs assignment was in the Far West to the Department o the Columbia in what was still Washington Territory General N. A. Miles was in command there.

There they tried the young lieutenant's mettle firs He was sent into forest on surveying expeditions and h was ordered to "shoot" the stars for more precise map making. Still, for him, it was not engineering, not th actual constructive work for which he yearned, no building and creating.

His chance was not long in coming. A flood washe out the bridge over the Spokane River, and since that wa the main road to Fort Spokane, Goethals was ordered t replace the bridge with no time wasted.

Here was his first big piece of engineering work, th job to which he had looked forward so eagerly, and nov



that it had come he found himself nervous and bewildered. Not that the task was so difficult. The bridge was a wooden truss with a one-hundred-and-twenty-foot span, a standard piece of work that Goethals had seen in dozens of places.

But to build it, having never built a bridge before—

Afterward Goethals admitted that it was the hardest task that had ever confronted him, harder even than building the Panama Canal. "I had never built a bridge and I did not know much about bridge-building," he said. "That was part of my trouble. In addition, the bridge was a considerable distance from the sources of supply of everything excepting wood, and I was expected to do my work in a hurry. That was far and away the hardest bit of work that has ever come to me. It might not have been hard for an experienced bridge engineer.

He would have known exactly what to do. I did not; I had to find out as we went along. I read books all night and gave orders all day. However, we built the bridge, and on time. Those were the orders and they were followed. But no job since then has ever seemed so hard as that one.

"That is the way with engineering; it is scarcely ever the big, spectacular things that really count with an engineer. . . . Mere size sometimes matters; more often it does not. It is the difficulties overcome that make for greatness. . . . Nothing is hard if you know what you are doing. What makes my first bridge so stick out in my memory is that I did not know what I was doing. The man who is entitled to the most credit is the man who does something, no matter how crudely, for the first time. Those who come after him are directors or administrators—not originators."

But Goethals built the bridge, in spite of the difficulties. He had broken the ice, and now he was an engineer.

* * *

Lieutenant Samuel Rodman, stationed along with Lieutenant George Goethals, had a sister, and for long he discussed the possibility of having her come out to the Far West for a visit. Goethals, who had been proud of being a bachelor, began to be a little less proud. The sister's name was Effie, and when finally she arrived ever

ligible young man at the post called to pay his respects; mong them, Goethals.

Goethals came more often than the others, and finally e gathered the courage to propose. He was accepted. He nd Effie went East for the marriage, which took place in New Bedford, December 3, 1884. Their first child, a boy, vas born at West Point in 1886, and the second child, also boy, at New Bedford in 1890.

* * *

He was an engineer now, no longer dealing with heoretical problems but with actual and difficult jobs. For years, West Point had been the chief agency in America for the production of fine engineers, and many f the most difficult engineering problems in the country vere thrown into the lap of the Army. They dredged the ivers, keeping the inland waterways fit for navigation; hey explored the country and found routes for the rail-oads to follow; they probed for minerals and improved iarbors.

One such job was the Ohio River Improvement. This onsisted of dredging, the pouring of dams, and the con-truction of dikes, levees and locks. And to this job, Goethals was assigned in 1884. Goethals didn't realize it hen, but here was the finest training he could possibly iave for that big task later on, the building of the Panama Canal.

His position was assistant to Colonel William F Merrill, and Merrill minced no words in making th situation completely clear to Goethals at the ver beginning.

"You can wear your shoulder straps and your uniform Lieutenant," Merrill said, "and stand on your dignity. I which case there's plenty of office work for you to do. Bu if you want to get out on the job and into construction then you're going to learn under civilian assistants. Tha means dropping the uniform and putting on overalls. also means you become an engineer."

Goethals put on the overalls, and from then to the la days of his life, he never hesitated to make that gestur to put on civilian clothes or overalls and pitch into th job with energy.

There was almost a year on the Ohio River, a pricele year for Goethals, learning the way of water and of si under water, of dikes and locks and canals. He als learned to know the workingman, to understand h viewpoint. Military discipline is very necessary in a army, but Goethals learned that on an engineering jo understanding of the men at work is more to the poi and more valuable.

When his job on the river was over, Lieutenar Goethals found himself detailed back to the Academy a West Point, this time to teach Civil and Military En gineering. He felt like an old veteran now, standing b

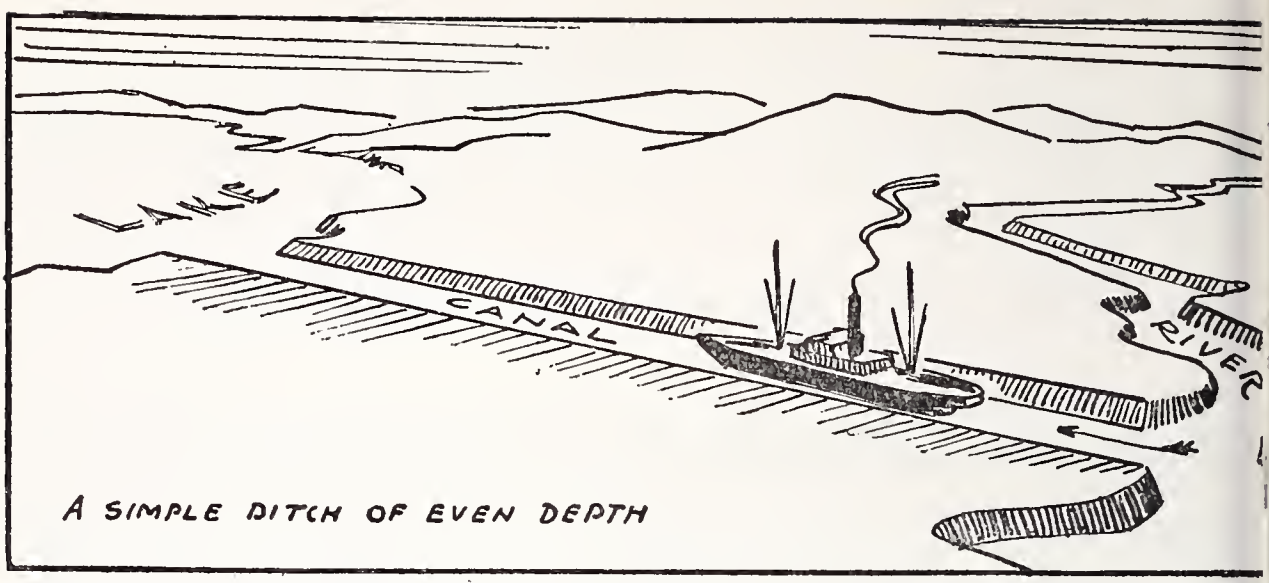
ore his class of younger men and telling of jobs he had one.

* * *

August 1889 and Goethals was back in the field, this me as an assistant to Colonel Barlow, who was building ocks and dams along the Tennessee and Cumberland ivers. Once again, there were weeks of valuable experience in river work: diking, building of locks, pouring slabs of concrete to hold back the water.

Two years of that and his superiors began to realize hat young Lieutenant Goethals was a very unusual type f man. Then his chance came, a chance for his first big ndependent command. Improvements were being made n the Tennessee River. The Muscle Shoals Canal was eing completed and a great lock was planned at Colbert hoals. They wanted an engineer to take charge, and they icked Goethals.

It was his chance to make good, but the task was not a imple one. Already the canal was weeks behind schedule. Now Goethals was given a certain date, before which he nust have the canal open for traffic. He had become Captain Goethals by now, and he did not hesitate to take the ull by the horns. Organizing two shifts, he threw himself into the work, directing the night shift himself. And he work was completed even before the limit of the time llowed.



"One method is to cut right through that hill"

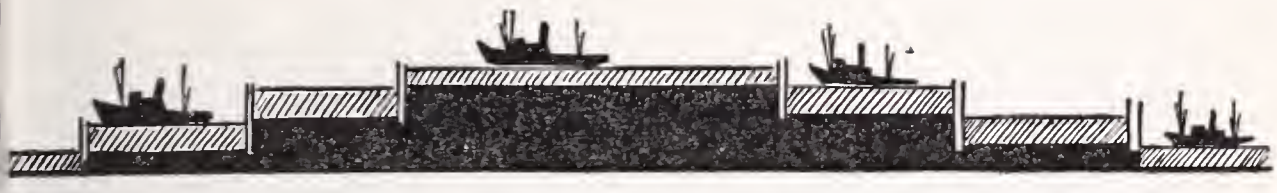
There too, on the Tennessee, Goethals had his firs experience in railroad construction. To facilitate the con struction work, he built a railroad fourteen miles long

There were three years on the Tennessee River, and i was during that time that Captain Goethals conceived th high-lift lock. It may be well here to explain the purpos of a lock in a canal. Digging a canal through a flat plai is very simple; all it means is to dig a ditch of even dept and fill it with water, and lo and behold! one has a cana

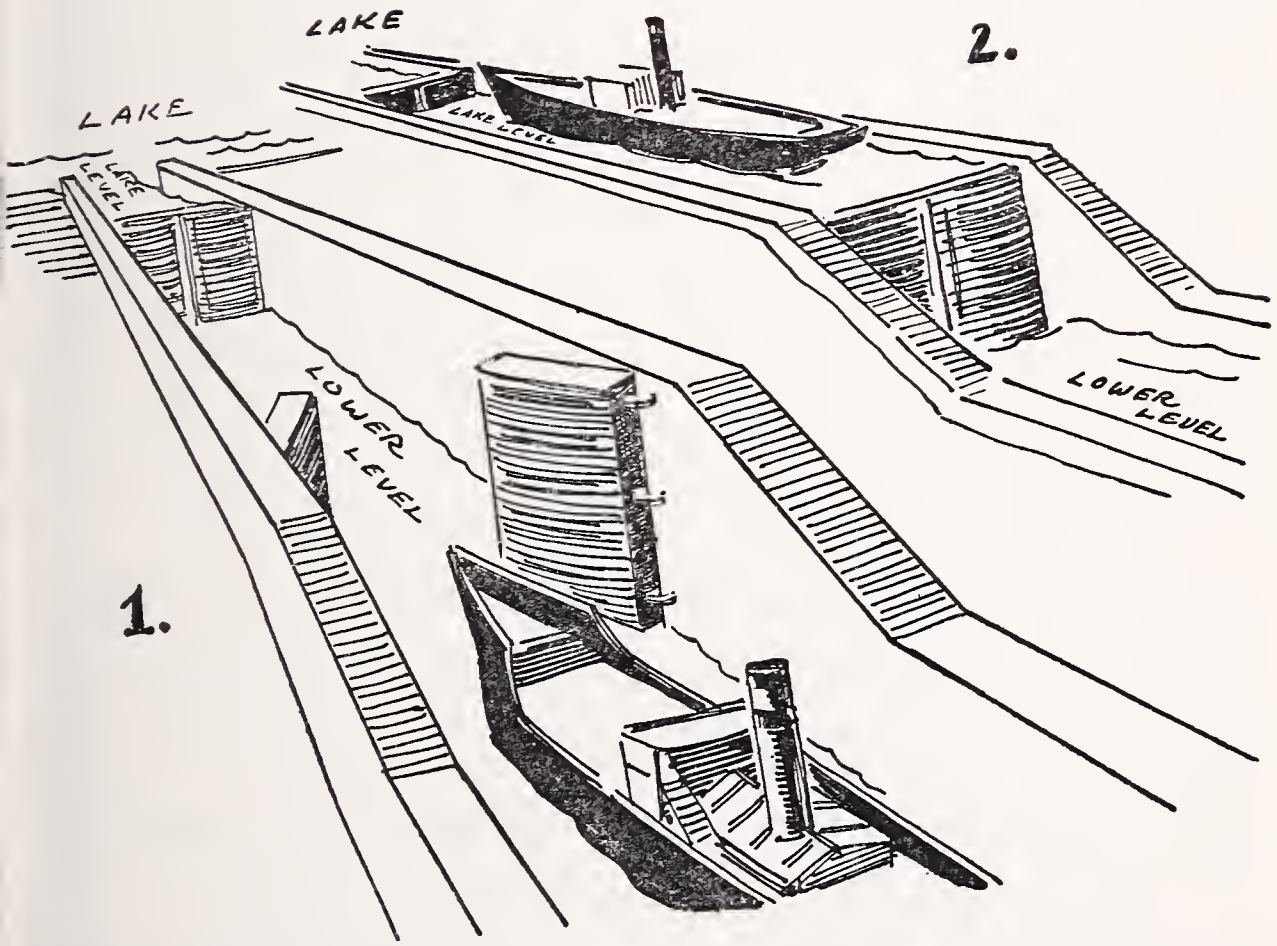
But suppose that canal has to go over a hill?

One method is to cut right through that hill, keepin the bottom of the canal at the same level. But it may b very expensive to cut through that hill. And if the hill i of rock, it may mean blasting out enormous quantities c material.

Or suppose the canal is being built in country tha slopes uphill. You can't make water run uphill, anc therefore, to keep the bottom of the canal level, you mus cut deeper and deeper into the earth. Presently the wall



A typical lock



A boat being raised from a lower canal to a higher one

of the canal will be hundreds of feet high and every additional foot of construction will cost thousands of dollars.

Then what is the answer?

The answer is simply to build many canals, each on a higher level as your country goes uphill, or on a lower level if your country goes downhill. If you come to a hill, you do not cut your canal right through it with walls a hundred feet deep, but build instead many short canals, each one a little higher than the other until you reach the top of the hill, and then each one a little lower than the rest until you reach the bottom.

Of course this solves every problem but one—how to transfer boats from a low canal to a higher one, or from a high canal to a lower one. And that is where the lock comes in. If you look at the picture on page 21, you will see a typical lock, and in the lock a boat being raised from a lower canal to a higher canal.

As you can see, the lock consists of a pair of huge gates. These gates start at the bottom of the low canal and extend to the high watermark of the upper canal; so the gates contain between them a narrow canal that is as high as the high canal and as low as the low canal.

When the boat is in the low canal, the water between the gates is kept at the same level as the water in that canal. The gate facing the boat is opened, and the boat sails into the narrow space between the two gates. Next

the open gate is closed and the boat is secure in the lit canal formed by the two gates. Then a pump is start and water pours into the little canal formed by the tw gates. As the water rises, the boat floating on the wat also rises, until at last it has been lifted smoothly to t level of the upper canal.

At this point the pumps are stopped and the oth gate opens, and the boat is free to sail away on the oth canal, having never once left the water.

Now when Goethals took over the work at Colbe Shoals, there were already in existence on the Tenness River eleven locks such as have just been described. Ea of these locks had a lift varying from twelve to fourte feet, and now it was proposed to construct two mo locks at Riverton with a lift of thirteen feet each.

"But why two locks?" Goethals asked himself. "Wh not a single lock with a lift of twenty-six feet?" One su lock would cut the cost almost in half, and it would al cut almost in half the time needed to pass a boat fro the lower canal to the upper.

But no one had ever heard of a lock with such a li Clearly, it was impracticable and impossible. But Capta Goethals went ahead, designed the impossible, built t impossible, and finally made it work. Here again he w preparing himself and the engineering world for t great project of the Panama Canal, where three locks pr duced a combined lift of eighty-five feet.

Bids were taken for construction of the lock, and the ɔb was finally awarded by the authorities to the lowest idder, a man whom Goethals did not believe capable of ıe task. The captain's feeling proved right. The private ɔntractor messed up the job and left his preliminary ex- ıvation a mass of quicksand and broken piling.

Goethals took over himself. He had the contract an- ulled and hired labor to complete the job. In charge he ut a civilian called Williamson, a steady, efficient, and ɔnest man who was to work with Goethals on every :her job he tackled.

The task was not easy, but Goethals did it. That had :come a habit of his, accepting difficult assignments and ɔmpleting them to the satisfaction of everyone.

* * *

Thus another link in the chain of events that was to nd a man finally to Panama had been completed. oethals had put in years of work on rivers, canals, dikes, cks, and dams. He had tackled every angle of every :oblem, and he could have hardly done better had he :en preparing himself for the single job of building the ınama Canal.

Four years now followed of further preparation for a sk still undreamed of. Goethals went to Washington, ıd while there it was his duty to study and report on all ntracts, surveys, and engineering work taken on by the

Engineering Department. It was office work for the mo part, and therefore not too much to his liking, but it w the sort of executive task that was to prove priceless in t future.

Meanwhile, the whole train of sad circumstances th finally led to the war with Spain was in the makin Finally, in April 1898, war was declared, and im mediately the various generals began to bid for Goetha services.

Goethals accepted a Lieutenant Colonelcy with Ma General John Rutter Brooke of the First Army Corps.

When Captain Goethals left the Department of E gineering, General Wilson, who headed the departme at that time, sent him the following letter:

OFFICE OF THE CHIEF OF ENGINEERS
UNITED STATES ARMY
WASHINGTON, D. C.

May 25th, 1898

Lt. Col. Geo. W. Goethals
Capt., Corps of Engineers, U. S. A.
My Dear Col. Goethals:

Although the regulations of the Army prohibit me from stating in orders my deep appreciation of the earnest, faithful, efficient and thoroughly loyal assistance you have given me during the past sixteen months, there is neither law nor regulation which will prevent me from expressing my great personal regret that your promotion will deprive this office of your intelligent and energetic assistance and that I

am to lose from my immediate official associates, one whom I have learned to admire and respect for his energy, skill and ability and who has won my warm personal regard by a modest display of all those attributes which make up the accomplished soldier, the ever courteous gentleman, the faithful friend.

I congratulate the corps upon your well-deserved promotion.

God grant that you may return in safety to your loved ones, crowned with honors which you will surely win, and that the remainder of your life may be filled with health, happiness and prosperity.

Yours very sincerely,
JOHN M. WILSON,
Brig. Genl. Ch. of Engrs.,
U. S. Army.

* * *

General Miles, head of the Army at the time of the anish-American War, had recommended that the bilized troops be concentrated at a camp where they ght be trained. The site was chosen at Chickamauga rk, Georgia, and Goethals was given the task of pre- ring water lines and sanitary wells.

In that way, another bit of valuable experience was ded to Goethals' training. His pipelines were tight and wells were clean, but in spite of all that sanitary con- ions at the camp were horrible. There were thousands cases of typhoid fever and various lesser diseases. In t, during the Spanish-American War disease killed re men than bullets did. Goethals learned that where

thousands of men are gathered together, whether to wo
or to fight, sanitation is the first consideration. As a
under officer, he could do nothing effective about sanita
conditions at the camp, but he stored away many gri
scenes in his memory, mistakes that were not to be r-
peated at Panama.

From Georgia, the command to which Goethals w
attached went eventually to Porto Rico, but before th
did any fighting an armistice was declared. Goethals w
never to fight a human enemy, and his battles were nev
to leave death and destruction in their wake.

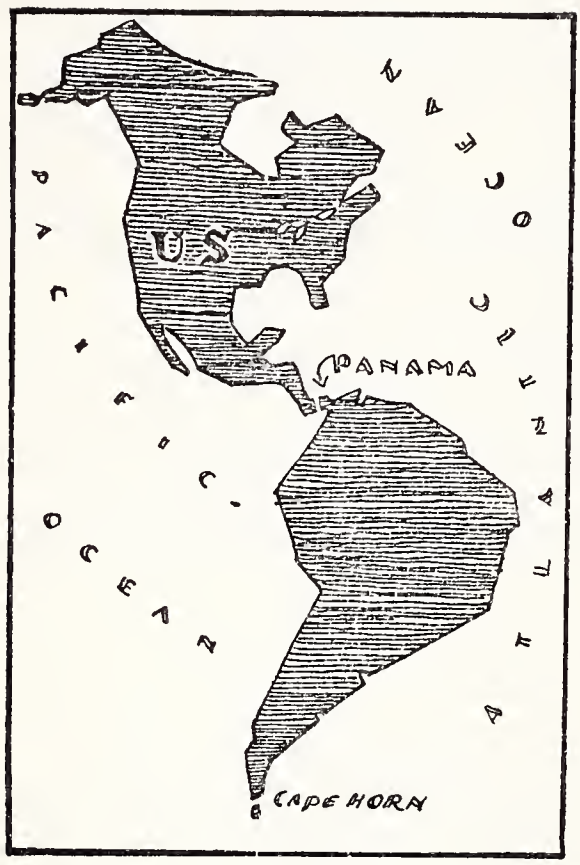
* * *

After his honorable discharge from the voluntee
Goethals returned to West Point, this time as instruct
in Practical Military Engineering. He would have r-
mained there four years had he not obtained his comm-
sion in the regular Army as major. Upon obtaining h
commission, he was placed in charge of the United Sta
Engineer Department District at Newport. This post p
him at the head of all river and harbor work from Blo
Island to Nantucket, but his main job was to comple
the seacoast defenses at Fort Wetherell and Fort Greb
Rhode Island, and Fort Rodman, Massachusetts. Add
to that was the problem of building railroads to haul su-
plies.

The chain of hard work and circumstances that was

ain a man for the greatest engineering job in history as almost complete.

In 1903 Goethals became a member of the General aff, and in 1905 secretary of the Taft Fortification oard. There he worked directly under Secretary of War aft, the man who was later to become President. oethals had traveled the full length of the road that d to Panama.



CHAPTER TWO

The Isthmus

IF YOU LOOK AT A MAP OF THE WESTERN HEMISPHERE, YO
will see how the continents of North and South Ameri
look like two inflated balloons with the narrow string f
the Isthmus of Panama holding them together.

Making, as they do, a long wall from the icecap of t
North to the icecap of the South, the two continen
closed the Pacific Ocean from the Western World. The
was only a narrow and dangerous passage at Cape Ho
in the south, and to gain this passage meant thousands f
miles of sailing down the coast of South America.

It was inevitable then that men should early ha

gun to seek a more convenient passage to the Pacific, to dia and China, and it was inevitable that they should ve sought longest for that gateway at the Isthmus of nama where the link between the continents narrowed a belt of land only fifty miles wide.

Thus the history of Panama becomes the history of an's search for a westward passage. And from the time its discovery by Rodrigo de Bastidas, in 1500, to the ne when Colonel George W. Goethals set out to build e canal, Panama's history was a story of violent death, ood and battle and murder, piracy and conquest. For ch a tiny country, it had history enough.

Here that story will be told—how for hundreds of years en dreamed of sailing their ships across that narrow ip of jungle and mountains that separated two halves the world.

* * *

Until the day he died Christopher Columbus never alized that he had discovered two new continents. He lieved that the stretching seacoast he had uncovered in e West was some part of Asia. In four voyages he asted that land, seeking for some hitherto unknown th back to Spain by circling the globe.

In his fourth and last voyage he sailed down the coast Central America, coming finally to Chiriqui Lagoon the coast of Panama. Here the Isthmus swung east,

and the Indians told Columbus that if he continued
sail along the coast he would come to a very narrow str
of land between the sea he was in and the fabulous sea
which he had heard rumors.

But Columbus believed he could find a water passa
between the Atlantic and the Pacific. What we kn
today as the Pacific he considered to be the Indian Oce
and once having found it he would sail triumphan
around Africa and back to Spain. Of course, he ne
found the passage because there was no passage. And
died believing that Panama was part of the coast of As

After the death of Columbus, the King of Spain se
two men out to colonize Panama, or Golden Castile, a
was then called. One of these was a nobleman and
other was a member of Columbus' crew on his secc
voyage. Neither of the two was very well fitted to colon
a wilderness, but with them was a lawyer named Enc
He had furnished most of the money for the expeditin,
and he was to play a large part in later events.

The expedition landed on the shores of Colombia, a
using that place as a base, they attempted to explore a
colonize Panama. Their efforts met with disaster. T
fought and killed Indians, and in turn the Indians ki
them.

Panamanian history had begun—with death.

Now two men enter the scene, men who were late to

lay great parts in the conquest of Spanish America. One
/as Pizarro, a lieutenant in the expedition, later to be
ıe conqueror of Peru. The other was a stowaway named
/asco Núñez de Balboa.

Starting as a stowaway, Balboa proceeded to plot to
ıle Panama. By intrigue, murder, and assassination, he
id away not only with the original leaders of the ex-
edition, but with the leaders of a relief expedition of
ew colonists. Ruthlessly he swept aside every obstacle
ı his path, and by March 1, 1511, he ruled supreme in
anama.

There is no doubt that Balboa was a hard and a wicked
ıan, just as were most of the other early Spanish ex-
lorers. But he had courage, and in one way he differed
om the other Spaniards—he treated the Indians fairly
ıd justly.

You must understand that these early Spaniards came
om a hard land and a hard school. In Spain for hun-
:eds of years they had fought the Moors, and only re-
ntly, in 1492, had they finally defeated them.

In their long years of warfare, they had learned little of
ercy or kindness, but of courage they had plenty. Their
eat and moving desire was for gold, and wherever the
mor of gold led them, they went, cutting their way
thlessly with their long swords of Toledo steel.

It was not uncommon for a handful of them to sail

across the ocean in one of their little cockleshell boats ar
penetrate hundreds of miles into the trackless jung
where no white man had ever been before.

* * *

On finding himself in power in Panama, Balboa's fir
act was to rid himself of anyone who could threaten h
position. Those few Spaniards left who had any pow
at all he persuaded to return to Spain, and they were n
loath to go. They believed that in Spain they could wo
against Balboa far better than here in Panama, where
was the supreme power.

In 1513 Balboa set out to cross the Isthmus and fin
that legendary sea of which he had heard so much. N
only was his imagination fired by the thought of bei
the first European to see the great body of water, but
had heard hundreds of tales from the Indians of t
great riches among the wonderful races of people w
lived upon its shores.

These stories had a grain of truth in them, for far
the south in Peru was the great civilization of the Inc
But most of the stories were circulated by the Indians
appease the Spaniards. They knew that the Spania
loved gold, and if they could persuade the Spaniards th
there was gold somewhere else, the Spaniards would
there and leave them alone.

Balboa, with a little band of followers, set out to cr

ıe Isthmus. Where he could, he made friends with the ıdians; where he had to, he fought them. Finally he ıme to a tall hill. From the top of this hill, the Indians ld him, the great ocean could be seen.

Balboa wanted to see this great ocean by himself. He ished to be able to say, without fear of contradiction, ıat he was the first white man ever to lay eyes upon it. e told his men to wait at the bottom of the hill, and one he climbed to the top. There he saw, far off and neath him, the quiet blue waters of the Pacific.

It took only six days, then, to reach the Pacific Ocean, hich Balboa claimed in the name of the King of Spain. was rather a large gift for the King, the largest ocean the world with all the land it contained.

But Balboa did not live very long after that, not at all

long enough to return to Spain with his pockets full o gold. Those men whom he had allowed to escape fron his company went back to Europe, where they had per suaded the Spanish King to appoint a new governo That governor became known as "Pedrarias the Cruel. It took him just three years to bring Balboa to trial fo treason and subsequently chop off his head.

* * *

A Spanish conqueror's place in the New World wa always uneasy. He could kill a certain number of h enemies, but there were always others left. To die of ol age was an unusual event in the story of these conqueror

"Pedrarias the Cruel" ruled Panama until 1526, at th end of which time he managed to reach the border fou steps ahead of Pedros de los Rios, the new governor. doesn't pay to inquire into their differences, of whic they probably had enough. But during the time he was power, "the Cruel" succeeded in building the city Panama on the Pacific coast of the Isthmus.

By now two permanent settlements had been esta lished in Panama, Nombre de Dios, which means "nam of God," on the Caribbean coast and Panama city on t Pacific coast. Between these two towns, through t steaming jungles and over the mountains, a trade rou was established.

At first it was no more than a jungle trail, but lat

ıe Spanish taskmasters drove their slaves to the building
f a narrow, cobbled road. Over this road, along the
Chagres River, through the steaming banks of jungle,
assed the wealth of an empire. The Chagres, a slow,
ıuddy jungle stream, was navigable for small boats and
anoes. From its headwaters the goods were carried on
ıe backs of little donkeys and sweating slaves.

It is impossible to estimate the wealth that passed over
ıis Isthmus road. Over it came the gold and jewels of
ıe Incas, stripped from their ancient cities by the robber
izarro, to be shipped back to Spain. Over it came gold
om the mines of Darien, silver from Bolivia, coco and
earls from the islands, wool from the uplands of Peru,
ıahogany from the jungles of South America, indigo,
bacco, dye woods, mother of pearl—such wealth as
rove men frantic with desire for more.

Goethals and the Panama Canal

The word "Panama" originally meant "place of muc fish" in the Indian tongue. It came to mean "place c much gold."

* * *

It was a long time before the world fully recognize the importance of the Isthmus. Perhaps it was because i those days there were no really accurate maps, and th seafaring nations could not understand that Panam was the only natural gateway to the west coasts of th Americas and the great treasureland of the Pacific.

But while the world failed to recognize that fact, the were some men who knew it only too well. A new e was dawning, one that would be celebrated in song an story for hundreds of years—the age of piracy upon th Spanish Main.

The Spanish Main was a section of the sea spreadin out like an open fan from the Isthmus of Panama an including all of the West Indies. Aside from the mai lands of Central and South America, there were hu dreds of islands in this area, the wealth of which w beyond computation.

And this wealth the Spaniards acquired merciless and competently. The Spaniards were not interested building colonies or in developing this part of the worl all they desired was gold and silver and such commod ties as could be exchanged for gold and silver. The

nethod was to take a territory and strip it clean of every-
hing it held, to turn the natives into slaves for their gold
nd silver mines and plantations.

It was not a kind method, but from their point of view
: worked splendidly. The wealth of the new world
oured back to Spain, borne in their great, brightly
ainted galleons.

On the other hand, France, England, and Holland had
o colonies to compare with the Spaniards' as treasure
ıests. Spain had already laid hands on the richest part
: the New World, as far as quick money was concerned.
f course, in the north, settlements of Englishmen were
:ing made, but such settlements produced no huge
nounts of silver and gold.

The easy reasoning went this way: "Since Spain has
much silver and gold, why not take some of it for
ırselves?"

Why not? At one time or another Spain was at war
ith all three countries—England, France, and Holland.
nd after all, men on the high seas in those days were
:ver too sure whether there was war at home or not.
hey called themselves "Free Traders."

Any Spanish ship was their rightful prey. They sailed
ıaller ships than the Spaniards', but speedier ones.
ıeir vessels bristled with guns, and they were sailed by
rd men who knew that a noose awaited them in every
anish port.

Actually they were pirates or buccaneers. They cam
to be called buccaneers because on their long voyages the
depended on smoked meat for food, and the men wh
supplied them with this smoked meat were calle
"boucaniers."

Once the free traders got underway, the easy securit
of the Spaniards vanished. No ship sailing from Panam
to far-off Spain was safe. And it did not stop at ship
Sometimes ten or twelve pirate vessels would band to
gether and attack one of the Spanish fortified towns alon
the mainland or in the West Indies. The free trade
would loot these towns, taking all the treasure.

There was one semilegitimate side to the activities o
the free traders. Coming across the ocean from Europe
they would carry cargoes of manufactured articles for th
North American colonists. Since they were forbidde
entry to most ports and since they instinctively dislike
paying duties, they smuggled most of these goods ont
the mainland. For this reason, however, they were we

comed by the colonists, who very often protected them and provided them with food.

* * *

The first of these buccaneers to achieve lasting fame was Sir Francis Drake, the man who defeated the Spanish Armada and left the glory of Spain rotting at the bottom of the sea. That is all that most men remember of Drake, but another part of his life was intimately bound up with Panama.

It is interesting to recall how Drake first achieved his hatred of the Spaniards. He was with his cousin, Sir John Hawkins, when an English fleet sailed into the harbor of Vera Cruz, Mexico, then held by the Spanish. The fleet came in all friendliness, and the Spaniards allowed it to enter the harbor and anchor under the guns of the fort. As soon as the English fleet was anchored and unable to maneuver, the Spanish guns opened up upon it. With the exception of two ships, every vessel in the

fleet was destroyed. Hawkins commanded one of the ships that escaped, Drake the other.

The treachery of this act made a deep and bitter impression on Drake's mind. He returned to England and pleaded with Queen Elizabeth to avenge the massacre but she replied that there was nothing she could do. England was not prepared for war.

Well, if England couldn't go to war, Drake would. He received the Queen's unofficial permission to prey on Spanish commerce, and with two ships he set off for Panama. His goal was the town of Nombre de Dios, on the coast of Panama, for here the gold was stored to wait shipment to Spain. With his two ships and a few smaller boats he had stored in their holds, Drake approached the Panama coast and attacked Nombre de Dios. He actually managed to invest and capture the town, being forced to fall back only because of a wound he suffered in the attack.

But it showed him that the thing could be done. He saw how necessary the Isthmus was to the Spaniards, and he made up his mind to hover over it like a bird of prey. He established headquarters on the Panama coast, and rapidly made friends with the Indians and escaped Negro slaves. That was not difficult; they had only to hear that he was an enemy of the Spaniards, and they came flocking to his camp.

They were his guides along the jungle trails, and soon

The Isthmus

Drake was the master of the road over the Isthmus. He was determined to take a great toll of the Spaniards, and he harried them like a wolf. He intercepted their pack trains, fired on their camps at night, even raided their cities. And once again he attacked Nombre de Dios. This time he was not wounded, and he and his men looted the Spanish King's treasure chest of all it held.

Drake wished to be the first Englishman to sail in the Pacific, but one of his band, John Oxenham by name, forestalled him. Oxenham, who was lured by the simplicity of extracting riches from the Spaniards in Panama, returned to Panama in 1575 with his own party of freebooters.

He crossed the Isthmus, launched a small boat, and adopted Drake's practice of preying upon Spanish shipping. For a while he was moderately successful, as pirates go, but he allowed his cupidity to override his common sense. With his little band he actually managed to capture one of the great treasure galleons from Peru. This was too much for the weary Spaniards. They exerted their utmost effort, got Oxenham, and put him and his crew to death.

Meanwhile, Drake had other more important things to do. He sailed around the world, and then he defeated the Spanish Armada, saving England from invasion. But the picture of Panama and its riches never faded from his memory. He had captured Nombre de Dios twice; why

not a third time? It was becoming a habit with him.

He enlisted his cousin, Sir John Hawkins, the other survivor of that first treacherous attack of the Spaniards on the English fleet, and the two of them led an expedition to Panama. With the same dispatch he had always displayed, Drake captured Nombre de Dios and burned it to the ground. Then he started across the Isthmus to attack Panama city. But this time the Spaniards knew he was coming and barricaded the jungle road so effectively that the English could not pass. Nothing daunted, Drake turned around and started off to attack Porto Bello, the place Columbus had discovered and named "beautiful harbor."

Drake doubtless would have been successful had he lived to complete the attempt. But a lifetime spent in piracy, freebooting, exploration, and warfare was beginning to have its effect, even on Sir Francis Drake. Close to Porto Bello, he took sick, and before the attack could be commenced, he died. He had written another famous and bloody chapter in Panama's troubled history.

* * *

But Drake had humbled the might and power of Spain, and other English freebooters added coals to the flame. Six years after Drake's death, a buccaneer called William Parker descended upon the unhappy coast of Panama and left Porto Bello in ruins behind him. I

seemed as though the Isthmus had been singled out as the one spot on earth which could never have peace.

If an English younger son wished to make his fortune and had courage and a little money to start an expedition, all he had to do was to turn pirate. The last and most famous of these semilegal pirates to prey on Panama was Henry Morgan. Just one hundred years after Drake had started his career of revenge against the Spaniards, Henry Morgan appeared on the coast of Panama and took Porto Bello.

Indeed, no English pirate was really anything of a pirate unless he sacked Porto Bello at least once during his career! The Spaniards would no sooner rebuild the fortifications and houses than another English freebooter would be along to burn them down.

Henry Morgan prided himself upon doing a thorough job of plunder. When he finished with a city, it was only because not a single article worth lifting remained. And when his ravaging of Porto Bello was complete, he sent a personal message to the governor of Panama, assuring him that he would soon be back to attack Panama city itself.

He was as good as his word. It took Morgan two years to gather a force he deemed sufficient for his attack on Panama, but he persisted. Then he returned and captured Fort San Lorenzo at the mouth of the Chagres River, placed a garrison there, and promptly recaptured

Porto Bello. This last had become a matter of habit with him, and it is hardly to be supposed that he thought twice about it.

He started up the Chagres River with twelve hundred men, driving the Spaniards before him. They retreated, destroying whatever was of value, and he advanced behind them, taking nine days to cross the fifty-odd miles of the Isthmus. Once at the city of Panama, Morgan invested it, but before it fell, fire broke out, destroying almost all of the city. The Spaniards blamed the fire on Morgan, but he constantly and steadily denied having set the flame.

However, whether he set the flame or not, he was hardly averse to plundering the town. He stripped Panama as clean as though a swarm of locusts had gone over it. Anything of any value, anything which might possibly be of any value, anything that glittered, anything that looked as if it might be sold for money, Morgan took with him.

Though Morgan later was knighted and became the governor of Jamaica, he had the soul of a very competent thief. He was not satisfied to leave the ruins of Panama until he had spent a month plundering them; it is doubtful whether he missed the merest, tiniest trinket. And while there, on the Pacific coast of the Isthmus, he did not confine his attention to Panama. Everything within fifty miles that wasn't nailed down and that might be sold for a substantial price in England he took. At last he left Panama, having picked it as clean as a buzzard picks the bones of its victim. Most of this booty he took with him when he left the Isthmus. Most of his army was left behind, directed by Morgan to get their pay from the prostrate country as best they could. If Morgan had forgotten anything, they made sure to pick it up.

Henry Morgan's piracy upon Panama was so bold, so unashamed, that the British government could not ignore it. It is true that the sins of the Spaniards were many, perhaps beyond computation; it is true that the Spaniards had wreaked upon the Indians as much and

more than the English had wreaked upon them. But at the same time, England and Spain were at peace. So the British outlawed piracy, which deterred the pirates not one whit.

* * *

It is doubtful whether any city in the world was sacked so many times in so short a period as unhappy Porto Bello on the Atlantic coast of Panama. After Henry Morgan's deeds had brought him world-wide fame pirates from all over the Spanish Main flocked toward Panama and Porto Bello. Here was easy picking, in their eyes.

The British decree outlawing piracy had the effect of throwing the French and the English pirates together. Hitherto, the English freebooters had operated in a shady pale, just within the law. As often as not, they would turn on the French, whom they considered almost as much their enemies as the Spanish. But now they were as much pirates and outlaws as the French, and they decided to combine forces against the Spanish.

Of course, the first thought that occurred to them was Porto Bello. The city had hardly been built up before the French and English freebooters raided it again, and again.

We can imagine the weary citizens of Porto Bello looking at the ruins, shrugging their shoulders and saying: "What's the use! In a little while the English will

be back—or if not the English, the French. Or perhaps both together."

You may ask why the Spaniards, in the face of all this, persisted in bringing their wealth through the Isthmus. The answer is that it was the only way. The great gold and silver mines could be approached only by the west coast of South America, while the Spanish colonial cities from which the goods were transshipped were mostly in the West Indies. And the same applied to the Spanish colonial empire of California.

Of course, they could sail around Cape Horn or around the world to the west, but both these ways were fraught with danger and meant thousands of extra miles of travel. For the most part they preferred to take their chances at Panama.

Meanwhile, Porto Bello showed an intrepid spirit. In 1679 the town was plundered by Captain John Coxon. This pirate, with three hundred followers, plundered the Isthmus for a full year, roaming from coast to coast and following Henry Morgan's example in lifting whatever was not bolted down.

For eight years, from 1680 to 1688, the pirates had a field day in Panama. They raged up and down the Pacific coast, plundering and destroying every settlement that existed. Nothing escaped their practiced eyes, and Panama, prostrate, wept tears of grief.

After that there was a brief interval during which England became the ally of Spain. England had protested

that she had nothing to do with the pirate raids, b
strangely enough, during her alliance with Spain, th
raids ceased. The weary citizens began to rebuild the
towns. In Porto Bello they had stopped counting th
number of times the city was sacked.

Then a number of years passed during which only de-
ultory pirate raiding disturbed the comparative peace f
the Isthmus. Forays were made, here and there a ci
was plundered; but there was nothing like the free-fo-
all raiding of the seventeenth century.

* * *

The uneasy peace in Panama did not last long. n
1738 war broke out between Spain and England, an
soon the English fleet, under Admiral Vernon, was o
its way toward Panama.

The citizens of the country had had hardly more tha
enough time to rebuild their shattered cities. Porto Be
was once more an uninhabitable place, and across te
Isthmus a new Panama city had arisen over the ruins
of the old.

Vernon's fleet headed straight for Porto Bello, whih
he sacked. The inhabitants fought, as they had fought
so often in the past—against Englishmen, against pirats,
against the Dutch, against the French, against anyone
who desired to fill his pockets with the rich plunder of
Panama.

The jungle crept back and took what was its own

But they fought to no avail. Once more Porto Bello vent down under the invader's heel.

Vernon was not satisfied to conquer Porto Bello a sin-gle time. He captured Fort San Lorenzo, and then once nore, two years later, he returned to attack Porto Bello.

Again Porto Bello fell. Vernon prepared for an attack cross the Isthmus against Panama, as his compatriot Henry Morgan had done so many years ago. But he vas not to be as successful. Perhaps the jungle had wea-ied of the men who came lusting into it after gold and lunder. At any rate, this time it was the jungle that lefeated him. Most of his men fell ill of fever and he vas forced to retreat.

When he turned on Cartagena, he was himself de-eated. And peace descended upon Panama. The last of he treasure galleons from Peru had turned away from he Isthmus when it heard of Vernon's attack on Porto Bello, and that was the beginning of the end of Panama's vealth and prosperity.

No more galleons discharged their cargo at Panama ity. No more of the wealth of Spain poured over the arrow jungle road. Porto Bello had peace; Panama ad peace; San Lorenzo had peace. The jungle crept ack and took what was its own. The old cobbled road vas overgrown, almost impassable. Spain was dying, nd a finger of that death reached out and touched anama.

CHAPTER THREE

The Gold Rush

IT IS STRANGE HOW ONE THING WILL AFFECT ANOTHI
when between the two there is no apparent connecti
But here we are building a long chain of incidents, sta
ing at the time when Christopher Columbus sailed in
the harbor of Porto Bello and extending to the time wh
George Washington Goethals was told to dig the deep
ditch of which any man had ever dreamed. If it had n
been for the discovery of gold in California, it is ha

to say how long the little state of Panama would have slumbered in obscurity.

You will remember how after Admiral Vernon's last raid no more treasure galleons shipped their gold through Panama. Spain had finally awakened to the fact that the Isthmus was not safe, and we can imagine the inhabitants breathing a sigh of relief. Finally they were to be left alone.

But it is one thing to be enough alone to be free of wars and pillage; it is another thing to be isolated. And the situation at Panama soon rapidly approached isolation.

Back in 1718 the status of the Isthmus was reduced from a vice-regency of Spain to a province of New Granada, which is what Colombia in South America was called at that time. And in 1821, when Colombia obtained its independence from Spain, the Isthmus was truly forgotten.

Gone were the glories of old Panama of the days of the Spanish treasure ships. Gone were the thriving cities and harbors, the roads so painfully hacked out of the jungle. Now the jungle crept close to their towns, and they hardly bothered to hack it away. Wet rot seeped into their houses, and they scarcely cared. Panama was asleep.

Then gold was discovered in California.

* * *

Goethals and the Panama Canal

You will remember the story of the discovery of gold in California. San Francisco, which was then called Yerba Buena, was a sleepy little Spanish town. And in 1848 California was a sparsely populated land of great ranchos and tiny villages. For two hundred years nothing had disturbed its quiet tranquillity.

Overnight, a change came. Gold was discovered.

Thousands of Americans flocked out to the gold fields. And not only Americans, but men of every race and every nationality. Young men and old men, honest men and dishonest men, family men, clerks, factory workers, adventurers, gamblers, murderers, pickpockets, common thieves, uncommon thieves—all had the same thought: gold.

For gold they were willing to endure every hardship. For gold they were willing to suffer and fight and die. Just as several hundred years before gold had impelled the Spaniards to invade the jungles of Central and South America, to suffer every hardship, to break down every barrier, so now gold impelled Americans to endure untold misery so that they might get to California.

There were two ways to reach California. The first was most difficult, but cheapest; that was the overland way. In the last resort, all a man needed was a pair of legs. If nothing else, he could at least walk. It was not an easy way. Even if he took the railroad as far west as

t went, there were still hundreds and hundreds of miles o be covered on foot or on horseback.

Usually men banded together and formed long wagon rains; not only for protection and convenience, but ecause the months required to cross the great plains, he desert, and the Rocky Mountains could drive a nan mad. Many never survived this trip; many died in he desert or in the cold of the mountains. Many turned ack.

For others, who had a little money, there was a much impler way to get to California. All one had to do was o take passage on a boat down the east coast to Panama. And since Panama was only fifty miles wide, it would ot be at all difficult to cross. And once across, at Panama ity, you took another boat north for San Francisco. Hardly any walking; merely an ocean voyage in comort to California.

Of course, very few of the people who prepared to go y boat knew any more about Panama than its name. t looked so easy that countless men immediately made reparations to go to California by way of the Isthmus.

Let's take, for example, one gold hunter in New York. We'll say his name is Jones, that he is a young man, and hat he has made up his mind to go to California by he way of Panama and seek for gold. He has about ive hundred dollars, which he considers ample for the

journey. He has heard that passage on one of the sailir vessels from New York to Panama costs from fifty one hundred dollars, depending upon the type of bo and type of cabin. Calculating that passage from Panan city to San Francisco is about the same, he is certa that his five hundred dollars will not only take hi from New York to California in comfort, but will lea him with enough money to buy his equipment for go mining. He takes as few clothes as possible, for he h heard that the cabins are small. He buys a pistol ar a long knife, feeling very foolish when he has the concealed on his person, but later on thanking the pr monition that made him buy them.

Then he goes down to the Battery to see about h passage to Panama. There he is surprised to find th he is not the only one who had the idea of going California by boat. Every captain of every coastwi boat, regardless of how small and how bedraggled th craft, is being badgered by hundreds of prospective pa sengers. The tiny Isthmus, forgotten for over a hundr years, has suddenly become of utmost importance. Th air is full of talk about Panama, the Chagres Rive Gatun, the jungle, the malaria.

And the price of passage increases every hour. Jon discovers that to buy a cabin on a boat is out of th question. Even to share a cabin will cost almost all

is five hundred dollars, and more than that on a good oat. The captains have enough offers to be able to pick nd choose and name their own prices.

As Jones realizes that the prices are constantly rising, e decides not to wait and buys a berth in a cabin for ne hundred dollars. It is a bigger chunk of his five undred than he was prepared to spend and he has to nare the cabin with nine other men, but for all that he glad he did not hesitate.

Before the boat sails, the captain is selling deck space; nat is, a place on the deck for a man to roll his blankets nd sleep—for eighty dollars.

Finally the boat sails, and Jones considers himself ucky that he got a place at all. See how many are left ehind. And after all, what do a few dollars matter hen a man can make his fortune in California just by icking the gold out of the ground?

Before the long, slow, uncomfortable trip is half over, ones begins to regret the fact that he ever thought of oing to California. The little craft, loaded to the top vith passengers, is never still for an instant. It bobs and ops and tilts and dips, and the men aboard are con-tantly seasick. It is thrown about in a storm and it lies ecalmed for days on end. The food is bad and presently he galley runs short of food. The passengers may com-lain all they wish; there is nothing they can do about it.

"But," the passengers say to each other, "just wa until we reach the Isthmus. Only fifty miles separatin us from the Pacific. A few days' travel and we will be o our way to California."

"I hear," someone says, "that there is a place whe the Isthmus is only thirty miles wide."

They speculate that a good walker could cross th Isthmus in two days on foot without any trouble.

Finally, after many weeks of misery, our gold hunte Jones, arrives at Panama. The boat drops anchor at th little port of Chagres and the cheering passengers b come suddenly hushed as they stare at the tall, impen trable, dark green jungle walls. They no longer spea of walking across the Isthmus in two days. Already the feel the hot, miasmatic jungle vapors.

"I brought you here," the captain says proudly.

Jones again regrets the adventurous urge that mad

im set out for the goldfields of California. He sees that
ıe dirty little village at the edge of the jungle is crowded
vith white men.

"What are they waiting for?" he wonders. "Why
aven't they gone to the Pacific coast?"

He soon discovers the answer. He is landed at Chagres
long with the others, and he finds that the first stage
f the inland journey must be made by Indian dugout
anoes. And there are not enough canoes. The Indians
re overwhelmed by the mass of travelers. And knavery
eems the order of the day. Some of the travelers have
ıistreated the Indians; others have cheated them. For
heir part, the Indians have mistreated and cheated the
vhite men.

"Is there no road inland?" Jones demands.

Men who have been there a week or two weeks point
ɔ the jungle. That is answer enough.

"But the Isthmus is only fifty miles across," Jones
ɔrotests.

"It might as well be a thousand miles," they tell him.
Nothing can get through that jungle."

So Jones waits, impatiently, his ardor for gold hunting
ıuch dampened. Now he is glad he brought the pistol
long. Many of the more desperate characters have
lecided to make their fortunes right here in Chagres
vithout waiting to get to California. There are knife
ights every day. Men are shot. Men fall sick of malaria.

Men go off into the jungle and are never heard of agai
Men turn back to New York.

But Jones sticks it out and finally he gets passage
a canoe. There are twelve white men and six Indians
the long dugout. The Indians pole with a long, slo
motion, and the dugout creeps up the sluggish strea

They progress about ten miles the first day, and th
make camp where the Chagres broadens into Gatu
Lake. Jones is uncomfortable and feels sick. The mo
quitoes are everywhere. One of the men is bitten by
poison snake and dies; another white man shakes wi
malarial chills. The Indians, who cannot speak th
whites' language, stay to one side, looking darkly at the
strange intruders from the north.

The second day they set out along the Chagres on

ıore. Again the Indians pole them through reeds and warms of mosquitoes. Crowded into the canoe, they ave neither peace nor comfort nor security.

And the third day the same thing. Another man has ıalaria.

The fourth day they are again between the high, owning jungle walls. The heat is unbearable. The ater steams. The mosquitoes are like a haze between ıem and the sky. Another man dies, and yet it is only fty miles from coast to coast.

At last they leave the boats and take to the backs of ny donkeys. They are riding over hills where later the reat Culebra Cut will be made in the building of the ınal. Although as the crow flies they are only ten miles om Panama city, it takes them two full days to get ıere, winding along the narrow jungle trail, crossing ɔuntless streams, going up and down hills.

Only fifty miles from coast to coast, yet it took them x days of constant travel.

In the old Spanish city of Panama, Jones' eyes are pened again, for the little place is teeming with men of very color and every nationality: American, English, rench, Spanish, Mexican, German, Dutch. Was there ver such a collection on the Isthmus before? And they e all waiting for the same thing—transportation to San rancisco.

The Spanish inhabitants of Panama regard them

queerly and curiously. These tall, blond Americanos- there are so many of them. It is a hundred years since th pirates raided the Panama coast, and since then th little town has slumbered in peace. Now it is rude awakened.

As to Jones, our man from New York—did he ev get to San Francisco? Probably, for he had money in h pocket. But this is the story of the 1849 gold rush on so far as to show what it did to Panama, and nowhe was the change more marked than in Panama city.

You would have thought, to walk through the ancie streets, that all the desperadoes in the world had co gregated there. Gambling dens were in full swin Liquor was selling for fantastic prices. Men died malaria even as hundreds more swarmed into the tow on their way to California.

The little bit of shipping that existed on the west coa of North America had been taken by surprise. It coul in no way accommodate the thousands who wante passage. Tiny schooners left for the north with men pile shoulder to shoulder upon their decks. Perhaps Jones w on such a boat. But many who had lost their money the gamblers and the saloons were left behind.

And passengers were not the only problem. The swe ing population of California was finding itself wi millions in gold and no place to spend it. They requir goods of every kind: clothes, food, arms, furniture, cour-

ss articles that were not obtainable on the west coast. ɔme, of course, could be freighted across the plains in ıe lumbering covered wagons, but the cheapest and ɛst way to ship was by boat.

Thus goods of every kind and description began to ɔme into Panama. Much of it piled up at Chagres, some : Colón; a good deal found its way across the Isthmus ırther to complicate the situation at Panama city.

No solution was in sight, and California was growing ıpidly. Something had to be done.

* * *

Perhaps from the time of the first successful operation : a railroad people had thought of a railway across the ɔthmus. What was more obvious? Here was the link be- ween the east and the west, and something had to be ɔne to cross that link.

Didn't they think of a canal? you may ask.

Certainly they did, and we will tell of that later. But it one thing to dream of the impossible and another to ɔntemplate the possible. At that time, so long ago, when ıodern engineering was in its most rudimentary stage, canal was impossible. But a railroad was clearly very ɔssible.

Andrew Jackson was the first President to realize that ıe United States must soon require an easy path of ɔmmunication between the Atlantic and the Pacific

oceans. He appointed a Mr. Charles Biddle to inves gate the situation and discover the easiest path of cor munication. Mr. Biddle decided upon Panama, visit the Isthmus, concluded that the scheme was practic and went ahead to obtain permission for railroad righ The government of Colombia, then called New Granad gave him the concession for the railroad, and in 18 Biddle returned to the United States.

He died before he could do anything more with t scheme, and since he had prepared no report the pl slipped out of sight. The California boom had not y come and there was no urgent demand for a railroad.

In 1847 a French syndicate became interested in t Isthmus and obtained a railroad charter from Colomb but they could not raise the capital to go ahead with t plan.

In 1848 things in California were beginning to boo Three Americans—Aspinwall, Chauncey and Stephe by name—contracted with Colombia to build the roa This time they were in earnest, and the Panama Railro Company with a capitalization of $1,000,000 was i corporated in New York.

A preliminary survey by Stephens showed that th could cross from ocean to ocean without having to over a higher elevation than three hundred feet. A cordingly, a party of engineers was sent out to survey t proposed line. They laid out a path for the railroad fro

món Bay to Panama city, a distance of just about fifty iles.

It was not long after that work on the railroad started. fty miles did not sound difficult; there were railroads America and Europe that were hundreds of miles ng. But the Isthmus was full of unpleasant surprises; had deceived hopeful men before. In jungle and amp, fifty miles can be a good deal worse than five ndred miles.

One can almost picture the Isthmus of Panama as a abolical being that took pleasure in torturing men who red to tamper with her. From Balboa to the Forty-ners, man after man had laid down his life in a fruit-s struggle against the Isthmus.

The first contractors who took on the railroad job ve up before they had fairly started and begged their ployers to release them from their contract. This was ne, and the company decided to dispense with con-ctors and undertake the work themselves.

Manzanillo Island was decided upon as a base, and ce it was cleared, the railroad struck out for the Pacific.

The first seven miles were through a jungle-covere swamp. There the contractors realized how seven mil in Panama could be worse than seven hundred mil somewhere else. The jungle had to be cleared. Piles ha to be driven into the swamp, so that a base for the trac might be laid.

Men worked up to their necks in black muck, with th ever-present mosquitoes winding like shrouds aroun their necks. In places the swamp seemed to have n bottom. Malaria got at the men; then dysentery. Trac were laid only to sink out of sight and the swamp seeme to mock at them.

At last the engineer came to Panama, but Panama w not giving up easily. Every inch of that dreadful swam had to be fought before it was conquered. And befo it was conquered in actual fact, almost every man on th job—surveyors, engineers, foremen, and laborers—ha contracted malaria.

* * *

Soon the most pressing problem of the builders w where to get men. It was not too difficult to entice me down to Panama with rosy promises, but once they we down there it was impossible to make them stay. Iri immigrants were brought from the United States, but n sooner had the Irishmen gotten a taste of Panama tha they packed up and left. They would stand up to th

evil himself, they declared, but they would not face six nonths on the Isthmus.

Negroes from Jamaica were tried next, but the kind of nalaria which infested the Isthmus got the best even of hese husky Negroes who were groaning and shivering vith chills and fever in no time at all.

The builders, desperate, imported one thousand Chinese coolies. Everything possible was done to keep hese Chinese fit, to make them want to stay at the sthmus. But disease broke out among the Chinese, as it ad among every other group at the Isthmus. Some of hem committed suicide; others fled into the jungle and ever emerged from it again. Within two months carcely two hundred of the Chinese were in a condition t to work.

And yet the railroad was to be only fifty miles long.

Afterward men declared that for every tie in the 'anama railroad a life had been lost. Well, the situation n the building of the road was horrible enough, but not o horrible as that. There were well over a hundred and fty thousand crossties in the road. During the construc- on period, some eight or nine hundred men on the job ied.

Civilization, if so it might be called, had finally come o Panama, but the jungle fought back with every trick nd horror it knew.

* * *

It took a year and a half to build that first seven mil of road through the swamp, almost three months fo every mile of track laid down. Originally a million do lars was thought sufficient for building the entire roa yet more than a million was spent and the road wa hardly begun.

Then a fortunate thing occurred. The rush to Cal fornia continued, even though the virgin wealth of th gold fields was beginning to peter out. The East was fu of tales about California's wealth and beauty. It was good land and a rich land, and a man had an opportunit there. Though the lure of gold was not quite so stron now, men still wished to go to California.

Two ships, filled with California-bound people, trie to put in at Chagres. But a storm kept them out of tha harbor and they continued down the coast to Colón which was the terminus of the new railroad. There wer about a thousand passengers on the two vessels and whe

ıey heard that a railroad was being built, they im-
ıediately demanded that they be carried inland as far
; the railroad went.

"But that is only seven miles," the officials protested.

"Seven miles in Panama is as good as seven hundred
ıywhere else," they said.

"But we've not decided on rates."

"We'll pay what you ask," the people declared.

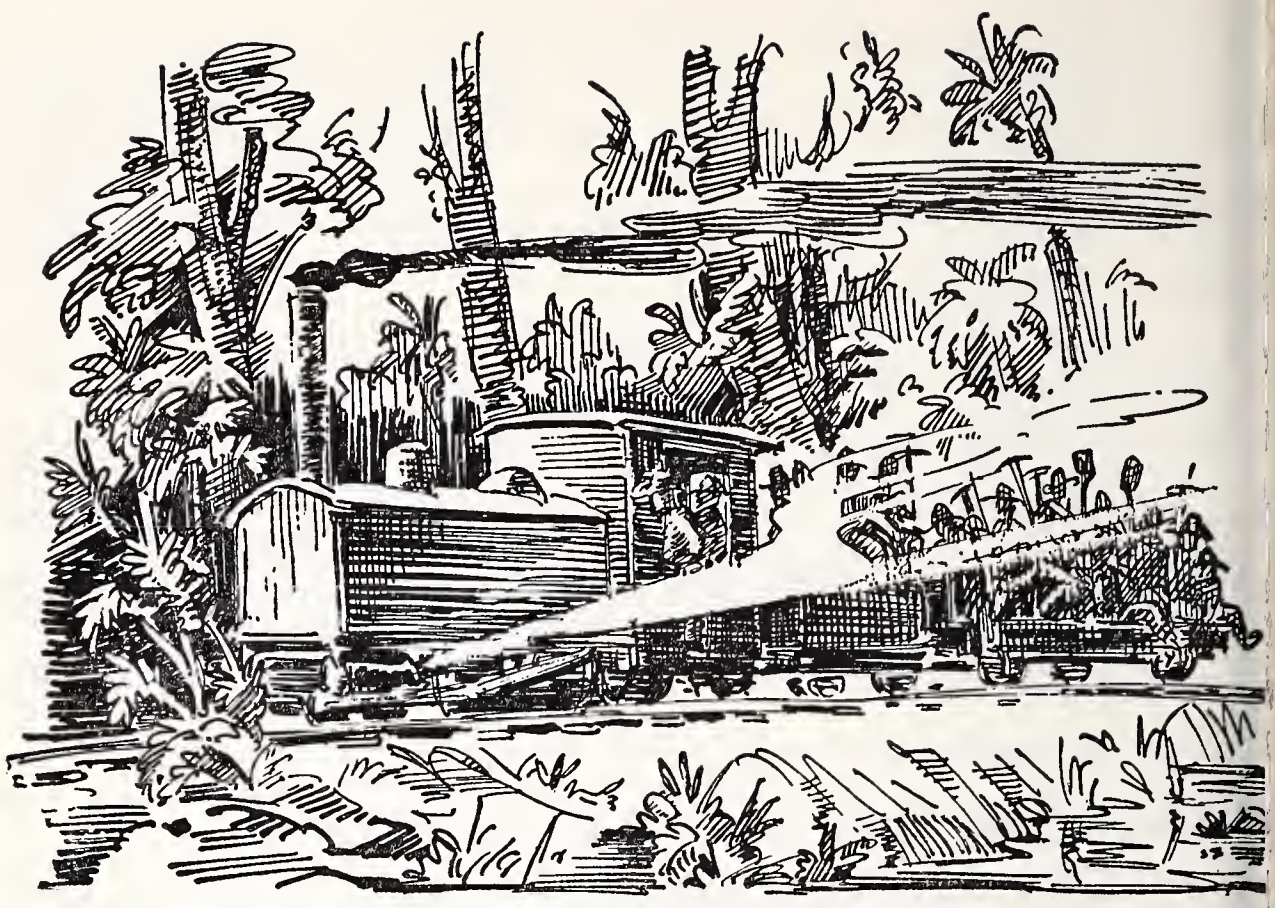
"But we have no passenger cars."

"Then we'll ride on any cars you have."

The officials agreed. They felt that if the railroad got
o further inland than seven miles, it would still seem
ıore like a railroad if it carried a few passengers. There-
pon the thousand people were loaded onto flatcars, and
arried inland.

Had it not been for that, the building of the road
ıight have stopped then and there. In the North, the
:ock was dropping steadily. Dreadful rumors were com-
ıg out of Panama concerning men who had been
ricken down by malaria and men who had died. People
ad not yet realized that the wars of peacetime take their
)ll, as well as the battles of wartime—with this dif-
:rence: out of the first came construction and hope for
ıe human race and out of the second ruin and desolation.

When the news that the railroad had actually carried
assengers—people who had paid to ride over its rails—
ıe stock in New York boomed immediately. Work on



the railroad was resumed, and in less than a year it ha penetrated twenty-three miles inland to the Chagre River.

Still it was much as if the job had only begun. Ever mile had to be fought for, and as the news seeped int the world, people began to realize how fantastic the pla of cutting a canal across the Isthmus had been. If it too so many years of backbreaking toil to build a railroad how could anyone ever hope to dig a canal, a vastly mor difficult feat?

Work on the railroad went on, but it was not entirel completed until 1859. By this time the additional expens of one million dollars had increased to eight million dol lars, and in the course of its forty-seven-mile length, on hundred and seventy bridges had been built.

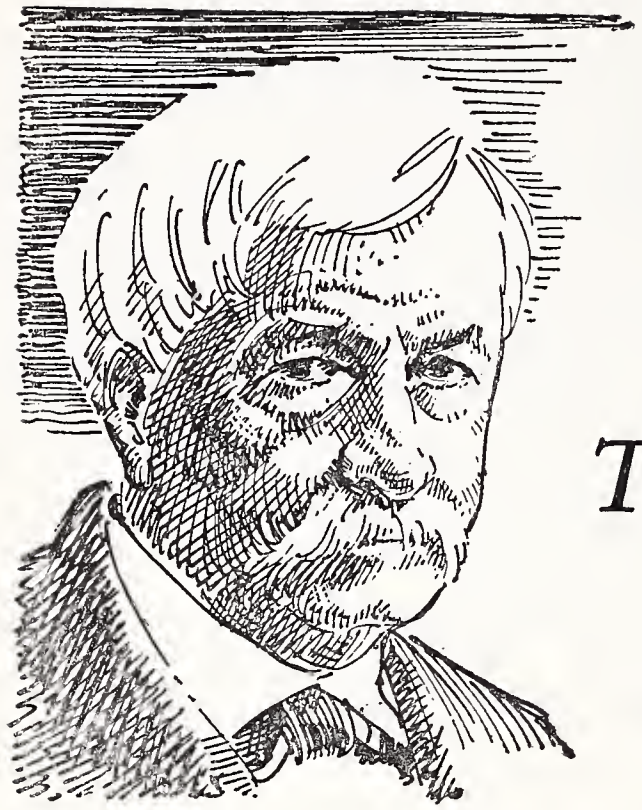
* * *

The Gold Rush

In the first years after it was opened, the Panama Rail-road made a great deal of money; indeed it brought more prosperity to Panama than that country had known since the days of the Spanish treasure galleons.

But as the years passed the trade began to decline. The United States had been spanned by transcontinental rail-roads, and much of the California traffic went this way. Also, as steam navigation came into widespread use, it was easier to make the long journey around Cape Horn, a trip fraught with great danger in sailboat days.

In the late 1800's the railroad sank into worse and worse shape. Panama was slipping back into its former state of dreamy isolation. And again the world began to talk of a canal.



COUNT FERDINAND DE LESSEPS

CHAPTER FOUR

The French Cana

WHEN CHRISTOPHER COLUMBUS HEARD FROM THE INDIA
that a narrow land bridge connected the two gre
masses of the north and the south, his first thought was
find a water passage through. As we know, there was
such passage. But it was the dream of every explorer
the New World to find an easy route through to t
Pacific Ocean. In the north, it was the Northwest Passa
of which they spoke; in the south it was a passa
through the Isthmus.

Within a very few years after Columbus had died the
was talk of cutting a canal through the Isthmus. In 154

he governor of Panama actually went so far as to order a urvey of the land with regard to cutting a canal from the Chagres to the Grande river. Luckily the idea was bandoned. At the time it is doubtful whether any mount of slave labor could have cut the canal, and thouands of lives would have been wasted.

But the idea captured the imagination of the world, nd indeed what could be more stirring than a proposal o sever the strip of land that linked two great continents nd divided the world in half?

Ideas ran riot, and as the years passed at least a dozen ountries produced a hundred different proposals to sever he Isthmus in one way or another. There were proposals or ship canals and proposals for barge canals, proposals or sea-level canals and for lock canals. Some wanted to ut the canal through Mexico, utilizing certain rivers, nd others wanted to cut a canal through Nicaragua.

But the strangest part of the whole matter was the ight interest displayed by the United States in the canal roject. It seems that for many years there was no Ameriin statesman with vision enough to realize that someday he entire destiny of the United States might depend pon a canal through the Isthmus.

* * *

In 1877 France came forward with the first concrete cheme for a canal through the Isthmus. Ferdinand de

Lesseps, a Frenchman, had already constructed the Suez Canal and through this had become one of the most honored men in all France. He was not a trained engineer, but the construction of the Suez Canal was a comparatively simple matter. All it meant was the excavation of huge quantities of sand and the digging of a straight sea-level canal. But because de Lesseps had been the first man to see the possibilities and carry them through, the honor and the credit were rightly his.

Still he was not an engineer, and because he was not an engineer thousands of Frenchmen paid millions of dollars for the privilege of being part of a great blunder.

This is how it came about.

* * *

In 1877, in France, a company was organized. It was called the French Canal Company, and as its name implies it was formed for the purpose of digging a canal. Not just any canal, but a canal through the Isthmus of Panama—a canal that would give France a viselike grip on the destinies of the Western Hemisphere.

It is difficult to understand just why the United States sat back and let the French go ahead, but that is what we did. And if the French had succeeded in their project it is impossible to say what course the history of the world would have taken. But the French were doomed to

failure from the very start—in their conception of a sea-level canal.

They sent to Panama a man called Lieutenant Lucien Napoleon Bonaparte Wyse, a surveyor whose name was far more thorough than his character. Sent to explore the possibilities of the Isthmus in regard to a canal, he did not even take the trouble to go completely across its fifty-mile width. He poked about here and there, saw a little, guessed a good deal, and finally came out with complete plans for a sea-level canal. He even had the audacity to figure costs to within ten per cent.

You have seen before the difference between a sea-level canal and a lock canal. A lock canal can go over hills, but in a sea-level canal the hills must be cut away. The bottom of a sea-level canal must be absolutely level. Due to tides, there is a twenty-foot difference at Panama between the surface of the Atlantic and Pacific oceans. The bottom of the proposed sea-level canal would have to be forty-five feet below the lowest surface water to allow ships to pass.

You remember the jungle-covered hills of the Isthmus. Try now to understand what it would mean to cut them all away, to cut a straight deep ditch right through the Isthmus to a depth of forty-five feet below sea level. We cannot say that anything is impossible, even such a canal as that. But it was certainly close to impossible. And its cost would have run into countless millions of dollars.

The story of the French Canal project is one of such a error of judgment. It is also unfortunately the story c corruption and unscrupulousness in the use of funds tha had been supplied by many thousands of thrifty Frenc people. Yet it is the story, too, of honest work on th part of some; of honest mistakes on the part of other That the plan collapsed worked to the advantage of th United States, for through that collapse we were enable to enter actively upon our own canal plans.

This is what happened: Wyse obtained a concessio from Colombia, of which Panama was a part, to build canal anywhere on the Isthmus. Whereupon he returne to France and sold his concession and plans to the Frenc Canal Company for two million dollars. Wyse came ou of it well; scarcely anyone else did.

De Lesseps appeared as chairman of the Internation Canal Congress in Paris in 1879, for the French Can Company needed his name for prestige. As has bee seen, de Lesseps knew little of complicated canal con struction, still less of the real situation in Panama. Neve theless, he was made head of the company.

In fairness to de Lesseps and the part he subsequentl played in the sorry story of the failure of this canal pla account must be taken of the fact that he was an old ma Moreover, he did not realize his own limitations.

At the Canal Congress engineers of wide experien and knowledge were allowed little opportunity for e

essing their expert opinion on what should be done. e Lesseps, who had already decided upon the sea-level nal of Wyse's survey, would not change his opinion. nd his admirers, who knew even less of technical en- neering than he, supported him completely.

Later de Lesseps did go to Panama, but he went during e dry season when the country was very beautiful—as ough Panama were smiling and thinking of what ould come later! He rode across the Isthmus on the ilroad, and after he had made this trip, he decided that gging the sea-level canal would be even easier than gging the Suez Canal had been. Worst of all, he made his mind to direct the job from his desk in Paris.

As finally decided, the French canal was to have a pth of twenty-seven and a half feet below sea level and width of seventy-two feet at the bottom, ninety at the ater line. Rather than build another railroad, decision as made to follow the path of the already constructed anama Railroad, leaving to chance that this would be a od canal route. A dam across the Chagres River was to ep the canal from being flooded, and a tidal basin dug it at the Pacific side was to take care of the difference in des between the two oceans.

Next, the French Canal Company set about figuring sts. It is curious that the known experience of con- actors in building the Panama Railroad did not open eir eyes to the fact that jungle and swamp are two

elements you cannot gauge in dollars and cents. But i did not. The Paris Congress made a definite estimate o $214,000,000.

The Technical Commission, which had actually gon to the Isthmus, promptly shaved this figure down t $168,000,000. And de Lesseps then cut $48,000,000 fro the estimate, deciding that with his personal supervisio the canal could be dug for $120,000,000. Moreove de Lesseps was confident he could direct the work i such a way that the canal would be open for traffic i six years, and he figured that the tolls for ships goin through would be $18,000,000 for the first year. At thi rate, the canal could not help but make money.

The proposal to build a canal received tremendous pub licity. French people by the thousands invested thei precious savings in the project. Their eventual loss o those savings seems especially sad in view of the fact tha engineers in England and America, even in France, ex posed the plan as hopelessly unscientific, saying that sea-level canal could not be built in six years, if at all. Bu the French people had faith in de Lesseps.

The project was ill-fated from the start. Machinery wa shipped to Panama, thousands and thousands of dollar worth of machinery—only to pile up on the wharves a Colón and stay there. For the Panama Railroad calml announced that it would carry nothing except at regula rates. And for the French Canal Company to do all i

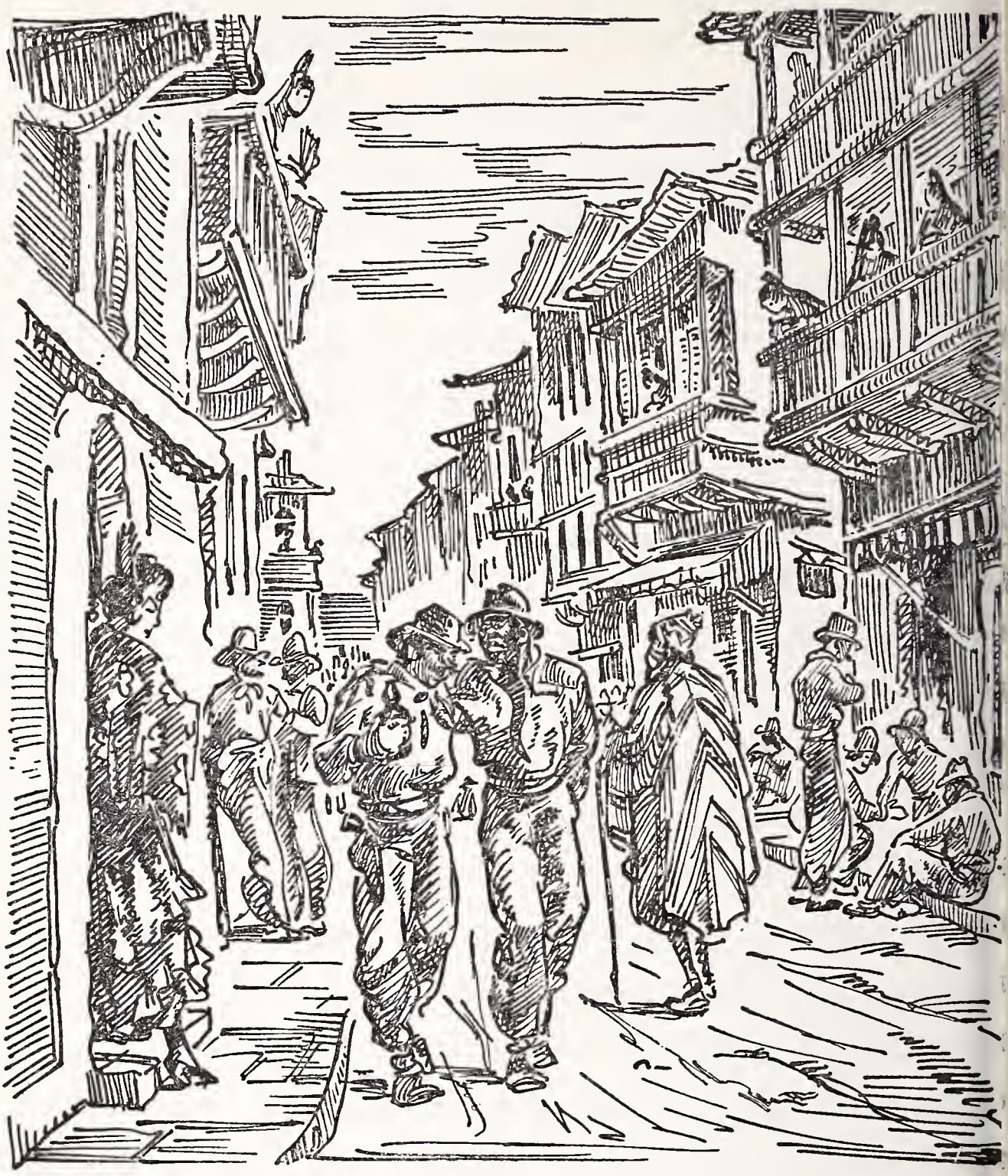
shipping by regular rates would have bankrupted it at the very start of the project.

There was nothing now to do, it seemed, but for the company to buy the railroad. The owners held out for a tremendous price—$25,000,000, three times the original cost—despite the fact that the road itself was now old and decrepit. De Lesseps had not calculated on this expense, but the money was paid, even though it meant that a third of the original capital was gone and work on the canal barely under way.

From this moment a broad and simple description of the French effort would be to say, "Everything went wrong." For even though the engineering staff itself worked honestly and did credit to France, even though the engineering director was later to be praised for his driving force and organizing ability, as well as for the fact that the amount of machinery he got into action was enormous for the period, even though headway was made on the excavation itself—even so, "everything went wrong" holds little of exaggeration.

As with the Panama Railroad in the days of its construction, labor was the first difficulty. It was almost impossible for the French to get decent, hard-working men to go to the Isthmus and stay there. As a result, they had to take all comers, and what they got was, in some ways, the scum of the earth.

Colón became a wild and boisterous town. It reeked



with liquor, gambling, and vice. The saloons were open day and night, and there were more hard characters concentrated into that small space than there had been in any of our western frontier towns. Aside from the few honest men at work upon the project, all others, it seemed, were there to cheat the Canal Company in any way they could. And they did.

In Paris, politicians grafted from the very beginning.

South Hunterdon Regional High School Libra

And the Paris employees of the company joined in—high officials as well as low, apparently with the idea that the project was a thin bubble, anyway, and with a determination not to come out on the losing side of the ledger for themselves. Of de Lesseps, history's verdict has been that any reproach against his integrity is unjustified.

Thus mismanagement and corruption entered into the story. And to it was added the tragedy of malaria. Malaria is the dread disease of the tropics. The name itself is from the Italian words *mala aria,* meaning bad air, and for centuries people believed that the night air rising from the tropical swamps caused the disease.

Even at the time when the French undertook to build a canal across the Isthmus, the real causes of malaria were not yet known. It was never suspected that the disease was communicated by mosquitoes that had bitten infected persons. To be sure, it had been noticed that people who used a great deal of mosquito netting suffered less from malaria, but this was put down to the fact that the netting strained out the bad air.

The most common method of prevention was to keep out the night air. This meant closing all windows and sleeping in a hot, airless room, a practice that was neither comfortable nor healthy. And it hardly kept a person immune from the disease, as it was as easy to be bitten by a mosquito during the day as at night.

In the hospitals at Colón all doors and windows were

closed at night. And to keep the patients free of crawlin bugs, each of the four legs of the hospital bedsteads wa immersed in a basin of water. These little basins of stag nant water provided admirable breeding grounds fo mosquitoes.

Malaria was everywhere. Swarms of mosquitoe hovered over the swamps. The streets of Colón were ful of dirty, stagnant water. Hundreds of rusty cans provide other breeding grounds for the ever-present mosquit Men at work upon the French canal fell ill by the hun dreds and by the thousands.

To the casualties brought by malaria, to the incom petence of the laborers at their best, there was added fo the honest engineers who persisted in their task the un certainties of revolution. Panama was then part of th South American country, Colombia, but not a happ part. Frequent rebellions hindered the progress of cana construction.

Nevertheless, in the nine years that the French attemp lasted, a good deal of excavation was achieved. Th French started the famous Culebra Cut, which Goethal later finished, and they took from it millions of cubi yards of dirt. An American contractor dredged th mouth of the canal to Gatun Lake. Despite bad manage ment, bad machinery, bad planning, two-thirds as muc dirt was excavated as had been dug up at Suez.

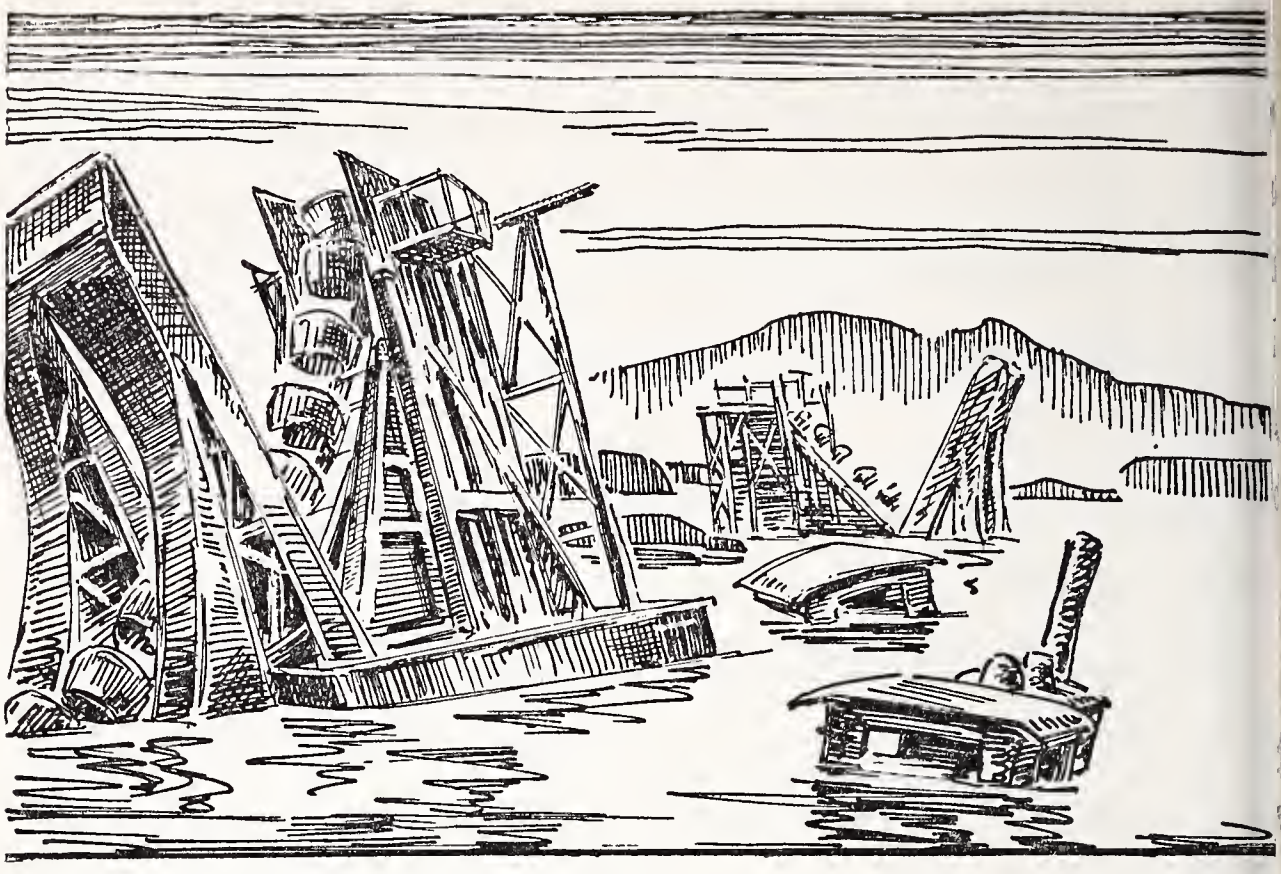
Yet with all this the end was nowhere in sight. And th

financial situation of the company was rapidly becoming acute. People in France began to grumble. They had been told that this would be an easier job than the Suez Canal, but already it had cost twice as much. What of de Lesseps? Was he as wise and as capable as they had thought? What of their hard-earned savings? What of their investments?

The questions swelled to a roaring demand for the facts. The French Canal Company began to slide—slowly, at first, then rapidly into the pit of bankruptcy. A receiver was appointed and an investigation was gotten under way.

This investigation turned up a hornet's nest. It seemed that even some of the government personnel were involved in the sorry graft and the ruthless appropriation of the people's savings. Charges were made against de Lesseps, and though it was brought out that he was indeed a mistaken old man rather than a thief, he was sentenced to five years' imprisonment. The old engineer did not serve that sentence. Completely broken, he lived but a few months more. The people of France lost all the money they had invested in the plan.

Across the water in Panama millions of dollars' worth of machinery lay idle, gathering rust in the wet jungle. The work camps were abandoned and the mad boisterousness of Colón died away. Mud began to slide back into the Culebra Cut, the notch the French had succeeded



in cutting into the Darien Mountains. The big barges sank deeper into the swamps, and the snakes and alligators crawled back to their domain.

One more attempt was made by the French before they gave up their dream of a canal through the Isthmus. A new Canal Company was organized out of the wreckage of the old one, and with the tacit permission of the French Government this company made an attempt to go on with the canal work.

They secured an extension of the concession from Colombia on the promise that they would complete the canal in ten years more; but it soon became apparent that not even twenty years would see the work done.

Both the French people and the French government were completely disgusted with the canal scheme, and they would not invest a penny more. Without money the

new company could do very little. Not more than a few hundred men were kept at work, and at that rate, it was realized there would be no canal even by 1930.

Despairingly the French looked around for a purchaser. There was only one customer with both the money and the interest—the United States.

PRESIDENT THEODORE ROOSEVELT

CHAPTER FIVE

Uncle Sam Goe to Panama

IN AMERICA, EVEN BEFORE THE FAILURE OF THE FRENC plan to dig a canal, it became apparent to many peopl that we had a vital stake in the Canal Zone. For whateve foreign power built a canal across the Isthmus, whethe France or another nation, America would be at its merc It is inconceivable today that America slumbered so lis lessly while France went ahead with her plans.

With sudden, rude violence, America was flun awake. In 1898 we went to war with Spain. The war wa fought in two places, each thousands of miles from th other—in Cuba and in the Philippine Islands. But Cuba

n the Caribbean Sea and the Philippine Islands are in he Pacific Ocean at the other side of the world. And etween the two places lay the great land mass of North nd South America.

The people of the United States awoke to full realiza- ion of what it means to have a fleet operate in two places t the same time. The battleship *Oregon,* needed in one cean when it was in the other, had to make the long, ow journey around the southern tip of South America. Had the Panama Canal been ours and operating, almost ven weeks could have been cut off that journey. And in ven weeks, in wartime, many things can happen.

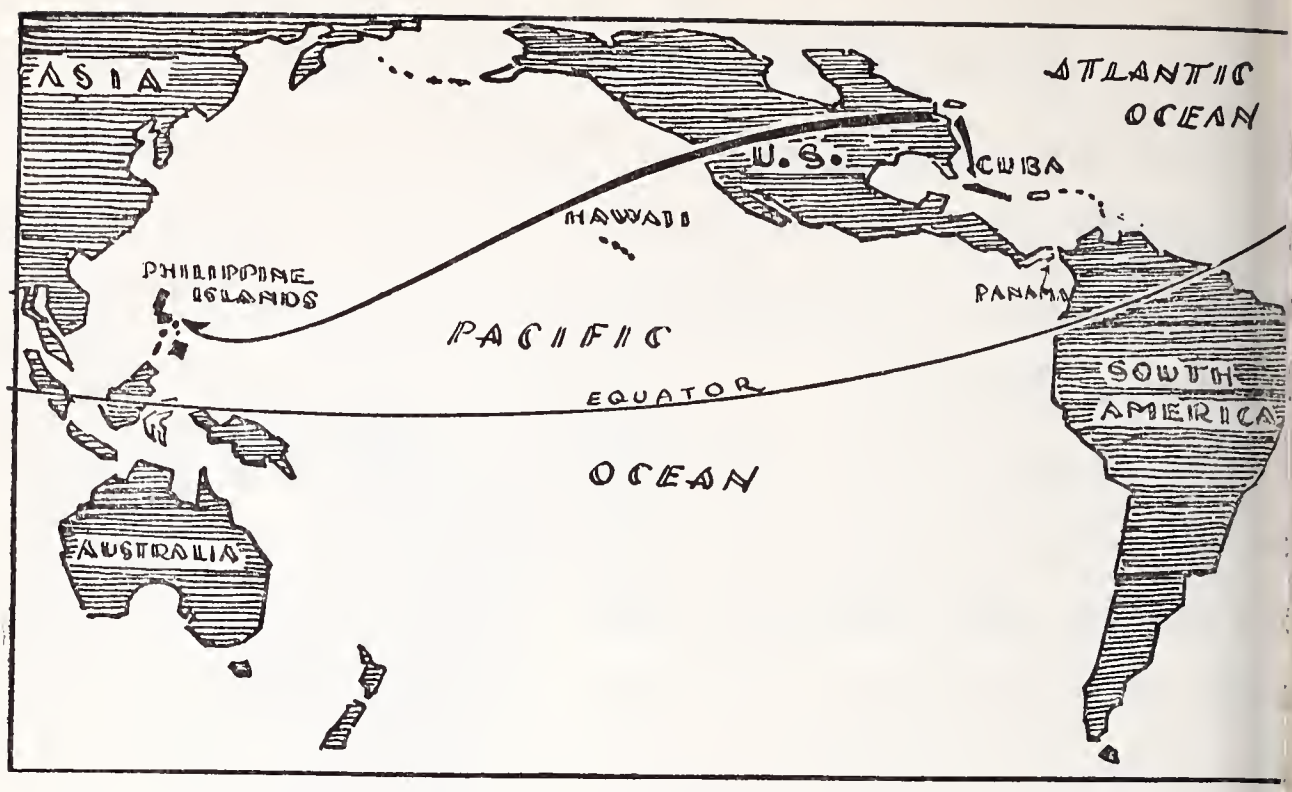
At the time our adversary was Spain, a weak country at could offer little resistance. But, we thought, suppose had been a strong European nation? What would have appened then? What use would our fleet be, cut in half, ith each half unable to be in touch with the other?

People began to say: "Were we asleep?" "Why is an- her nation—from Europe—building the canal?"

But it was too late, and only providence saved us—that nd the corruption of the French officials who wrecked e French Canal Company. When everything seemed opeless, the French Canal Company went into bank- ptcy, and the receivers sold all the rights and property the United States for $40,000,000.

It was quite the wisest $40,000,000 we ever spent.

* * *



In 1903, when we acquired the French rights, Theodore Roosevelt was President. Roosevelt, who lacked certain other things, had nevertheless a good deal of foresight. He realized that a time would come when a Panama Canal would be very necessary to the defense of the United States. Thus, when an offer was made to Colombia of $10,000,000 granting the French Company permission to make the sale to us, a provision went with it that we should have full possession of a strip of land ten miles wide across the Isthmus.

This provision was necessary for two reasons: first, so that we might defend the canal, and second, so that we might police it and keep that part of Panama, at least, healthy. If you rent a house, you are not interested in making all sorts of improvements at your own expense; but if you own it, you are. That's the way we felt about the canal.

Colombia did not at once agree to our offer, for they

elt—and rightly—that the territory desired was worth a arger amount and also that the United States could afford to pay more.

Now the people of Panama, who were then governed y Colombia, were convinced that it was vital to their nterests for the United States to build the canal through ne Isthmus. Therefore, when they discovered that our ountry was considering the possibility of a canal in Nicaragua, a territory where our nation had a concession, ney sent a delegation to the President of Colombia, Marroquín, threatening revolution unless Colombia greed to the American offer.

So it came about that the final steps in the acquiring of ne Canal Zone territory by the United States of America ere taken by way of a revolution against Colombia by ne people of Panama.

Marroquín shrugged his shoulders in answer to the emand made by the Panama delegation. And the people Panama decided to proceed with their plans. For a ng time they had suffered misery and depression. In the uilding of the canal they saw hope for some sort of ecent life, perhaps even for prosperity.

They selected the afternoon of November 4th at anama city as the time and place to act. Unfortunately r their purpose, their plans became known to the olombian government, who were thus enabled to make unter plans of their own.

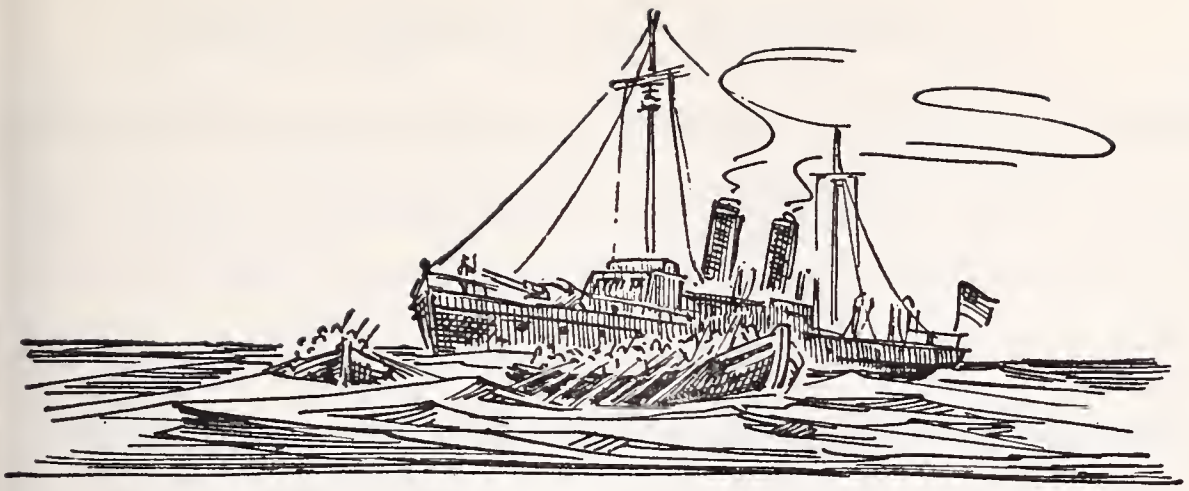
On November 3rd, the day before the revolution wa scheduled, four hundred troops with several general commanding arrived at Colón from Colombia. In orde to reach Panama city, transportation by train was nece sary across the Isthmus.

When the generals of Colombia approached the rai road's officials, asking for a train to transport the arm across the Isthmus, they met an unexpected obstacle. Th railroad officials refused to provide the train unless th regular fare of two dollars and twenty-five cents pe person was paid in advance.

Despite the generals' heated protests, the officials re mained firm. And in the end only enough money coul be gathered together to pay the generals' fare across th Isthmus. The army was forced to remain in Colón.

When the generals arrived in Panama, the revolutio ists were ready. The Colombians were arrested and pu into jail, and the people of Panama proclaimed an in dependent republic.

Back in Colón, Colonel Torres, who had been left i command of the Colombian troops there, received wor of the revolution and decided to go to the rescue of h generals. But the commander of the United States gu boat *Nashville,* which was lying off Colón, forbad Torres to cross the Isthmus—an action which certain was in excess of the naval officer's powers—and Torr retaliated by threatening to kill every American at Colón



The local American residents at once sent their women nd children to the two ships in the harbor and barricaded nemselves into the stone station building of the Panama ailroad. Meanwhile, the *Nashville* landed about sixty ilors and marines. At the prospect of war with the nited States, Torres withdrew his threats.

But the revolutionists at Panama were still faced by the rospect of four hundred hostile soldiers at Colón. One ossible step was to fight them; another was to buy them f.

"Why not try the latter?" reasoned the Panamanians. We have the treasury now."

After some dickering, the Colombian soldiers, discon-nted as they were, were bought off, boarded a ship and iled back to Colombia.

* * *

President Theodore Roosevelt acted quickly in recog-izing the new Republic of Panama. But he also made ure that nothing would happen to this new republic and United States prospects of building a canal. He gave

orders to our fleet to prevent the landing of Colombian troops within fifty miles of either Panama city or Colón. And since fifty miles in the jungle was equivalent to five hundred miles anywhere else, he as good as prevented Colombia from opposing the revolution in any way.

Colombia protested, even promising to accede to all our demands if only she could recover Panama. But Roosevelt refused.

Historians, playing the searchlight of their analysis upon these events, have raised certain questions. Was President Theodore Roosevelt right or wrong in preventing Colombian troops from fighting a battle with Panama troops? Was he interfering with the rights of a sovereign nation with whom we were not at war? Posterity and the future course of events will decide.

Succeeding events concluded negotiations for the Panama territory as a canal possibility. A treaty was signed between the two countries, and for the payment of $10,000,000 to the Republic of Panama, plus an annuity of $250,000, the United States received full privileges to build and maintain a canal across the Isthmus. We also received a strip of land five miles wide on either side of the route planned for the new canal. This was the Canal Zone, and it is United States territory.

The New French Canal Company was not slow to accept the $40,000,000, and it formally turned over all its assets at the Isthmus to the United States of America.

Thus, at long, long last, Columbus' dream of a west-ard passage to the great sea was coming to fruit.

* * *

The business of setting the new Canal Zone in order, f carrying out sanitation work, and of building the canal as gotten under way in March 1904. Congress created ıe Isthmian Canal Commission, which was a board of even men, appointed by the President. Five of the com-ıission were engineers; the other two were Army of-cers.

But the men on this commission, though all were onest and capable, could not work together. They tried resume excavations, using the old, rusted French ma-ıinery, and as a result they accomplished almost othing.

Theodore Roosevelt was a man with a passion for get-ng things done. He begged Congress to allow him to re-uce the commission to three men, one to supervise from ıe United States, one to be in charge of all construction ork at the Canal Zone, and the last to enforce the law ıd sanitary regulations at the Canal Zone.

Congress put him off. They were afraid of a scandal ıch as had occurred during the French attempt. Instead buying millions of dollars' worth of new machinery ıd putting an army of men to work, they doled out ıoney in tiny sums.

By this time the public was crying for the canal to b dug, although how it was to be dug no one was at a certain. President Roosevelt, as a final resort, asked f the resignation of all but one member of the commissio

On July 1 John F. Stevens was appointed chief e gineer. He remained in that position for several yea but even at that time people were speaking of anoth engineer who might be even better fitted for the job.

His name was George Washington Goethals.

CHAPTER SIX

1 Man Went Down to Panama"

LEFT MAJOR GEORGE WASHINGTON GOETHALS IN 1905 secretary of the Taft Fortification Board. Mr. Taft, o was later to become President, was then Secretary War. Certainly Goethals was not too happy in this rk. His being an Army officer came second to his being

an engineer, and as an engineer his one great desire wa to have a job big enough for him to handle.

It is hard to say what he felt when he went down t Panama in 1905, not as an engineer to work on th canal, but as a fortification expert to decide how the cana might be defended once it had been completed. Bu surely he was not too happy.

"Isn't this putting the cart before the horse?" he ma have thought to himself.

The most important job was to get the canal built, an to Goethals it did not seem that work on it was progres ing any too quickly. Afterward he described conditio at the Isthmus in just one word:

"Chaotic!"

He abhorred filth and disorder and lack of syste and all of that he found in the Canal Zone. Goetha mode of thought was simple; when a job was given hi to do, he did it. That is all. He couldn't help wonderi whether anyone was doing a real job on the Panam Canal.

But he was an Army officer, and his duty was to ma notes on fortifications, not to criticize; therefore, he d not criticize. He went here and there, he observed ca- fully, and he stored away facts. But he said nothing f or against the work at the Isthmus.

Afterward—people wondered at this, and some sa he had little interest in the work on the canal. That, f

ɔurse, was not true. Nothing in the way of engineering, ıuch less the greatest engineering task in the world, ɔuld have failed to interest Goethals.

* * *

Stevens, the chief engineer in charge of work on the ınal, was a good man, actively engaged in doing his ɛst. Which is all that any man can do. But he was fight- ıg an old and practiced enemy, the Isthmus. And the thmus was no mean antagonist. Panama, a land of ngle and swamp, had always suffered from disease and lack of sanitation.

In speaking of those days on the Isthmus, Chief Engi- ɛer Stevens once said, "There are three diseases in ınama. They are yellow fever, malaria, and cold feet; ıd the greatest of these is cold feet."

A great deal is remembered of the physical struggle build the canal; not so much of that other struggle at had to be won first. For long centuries malaria and llow fever had taken their toll of men in the tropics. nd nowhere was that death list more vicious than at ınama.

Men still did not know what actually caused malaria. ıt at the end of the 1800's some scientists began to lieve that the disease was transmitted by the bite of a rtain mosquito. Dr. Ronald Ross of the British army in dia experimented with malaria and discovered that the

carrier was the mosquito called *Anopheles*. This mos
quito bites an infected person and then a well person
thereby transmitting the sickness. Dr. Ross was one o
the great persons of history, yet few men remember hi
name, although in 1902 he received the Nobel prize fo
his work.

It was also believed that yellow fever was transmitte
in the same fashion, and out of this belief came one o
the greatest heroic actions in man's long struggle to ai
man.

Four doctors were appointed by the United States t
make a study of yellow fever in Cuba. They suspecte
that a mosquito transmitted the disease, yet they had t
be sure. Their names were Doctors Reed, Lazear, Ca
roll, and Agramonte.

How to make sure was the question. There seeme
no other scientific way than to allow themselves to co
tract the disease. The risks were great, but if successfu
the experiment might mean the saving of thousands o
lives.

Dr. Lazear volunteered, allowed himself to be bitte
contracted yellow fever, and died. He knew what he w
doing, and bravely and deliberately he sacrificed himse
so that his fellow men might live.

But one case was not enough; there had to be defini
proof. Dr. Carroll allowed himself to be bitten, contracte
yellow fever, and fortunately recovered. William Dea

n American private soldier, also bravely submitted to e important experimentation.

Still more proof was needed. A reward of two hun-ed dollars was offered to Army men who might vol-nteer. Two men came forward, John R. Kissinger and hn J. Moran. They were willing to be infected with llow fever, but only upon one condition:

That they were to receive no reward!

They were accepted; they were bitten by mosquitoes; ey contracted the disease, and they recovered.

This incident is worth remembering. There were more orious battles fought against the elements, against pri-tion and hunger and disease than were ever fought ith guns.

* * *

As soon as it was known that mosquitoes were the use of yellow fever and malaria, the question of how eliminate these dread diseases became greatly simpli-d. Do away with the mosquitoes and you did away th the disease. A whole new technique of disease evention had come into being.

America made certain that it would not fall into the which had made such a tragedy out of the building the Panama Railroad and the French Canal. The partment of sanitation was one of the first to be estab-ned, and the brilliant Colonel W. C. Gorgas, without

whose work the Panama Canal construction would nc have been possible, was placed in charge.

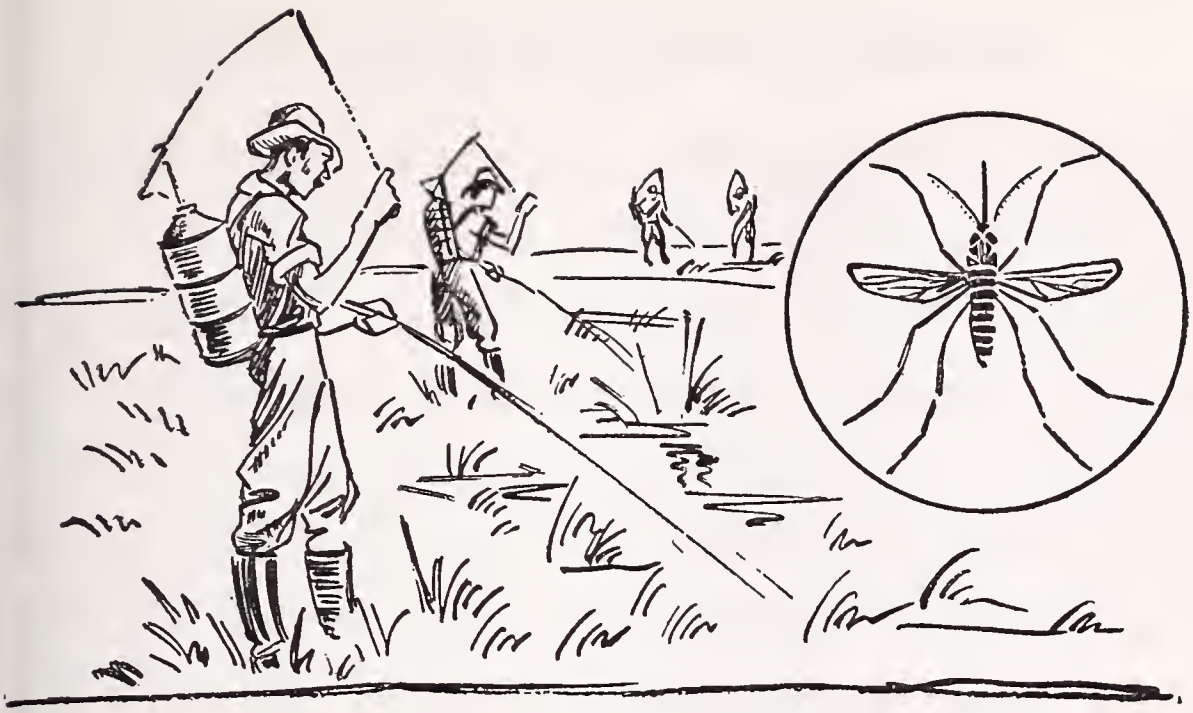
First, his task was to free the Canal Zone from filth an disease, so that working on the canal might not be matter of life and death; and second, his task was t make provisions for keeping the Zone in that conditio so that Americans could live there in comfort and t enable the traffic of the world to pass through.

The third disease of which Stevens spoke was "col feet." It is not difficult to understand why men feare the unseen enemies of yellow fever and malaria. The were both dread diseases, and in the early days of th Isthmus it was almost impossible to keep from bein bitten constantly by mosquitoes.

In 1904 there was an epidemic of yellow fever, an men fled the Isthmus by the hundreds. No offers, r wages could make them stay.

Gorgas began to fight on the dismal front of swam and jungle. Every place that might possibly become breeding ground for mosquitoes or was a breedi ground, was located. Oil was poured over water to k the mosquito larvae, swamp grass was burned. Th muddy, ghastly streets of Colón and Panama city we cleaned up and paved. Mosquito netting was install in all possible places, and those already sick were ca fully guarded from being bitten.

What Gorgas accomplished was in the nature of



iiracle. From a pesthole the Isthmus became a delight-
ıl tropical vacation spot. Of course, all this was not done
ı a day, or a week, or a year. But the fact that it did
ventually come about speaks wonders for modern
:ience.

* * *

Back from Panama, Major Goethals fretted and fumed
nd plodded along with his staff work. He suffered from
ıe basic unhappiness of a man kept from his real job.
Ie was an engineer, and it was his work to build, to
ɔnstruct, to plan, to take dirt and sand and iron and
ıake something beautiful and grand from them.

In other places, other men were doing big things.
oethals' hands ached for real work.

Then a short chain of events flung him into the driv-
ıg seat of the world's biggest engineering job. Stevens,
ıe chief engineer at the Isthmus, had been wanting to

resign for some time. He wished to get out of the Cana Zone and get back to railroad construction.

Then, in January 1907, Shonts, the chairman of th Isthmian Canal Commission, asked President Theodor Roosevelt to accept his resignation. He had been offere a very profitable job with the New York City subways

As a result of Shonts' resignation, Stevens decided t put off his own resignation no longer. He wrote to th President that he had long been anxious to leave th Canal Zone and that he wanted to give up governmen work entirely, returning to his old job of railroad con struction.

To lose two such good men at one time was a har blow to President Roosevelt, yet he had no other choic than to accept both resignations. It left him in immediat and urgent need of a chief engineer to take over th biggest job. There was no time to hesitate; he had t have a man and it had to be the best man. He calle in Secretary of War Taft, and one story goes that Ta was not hard put in making an immediate choice.

"Goethals," he said.

The other story states that Taft called on Gener Mackenzie, who found it no more difficult to select th fittest man in his service.

Either way, the choice was Goethals.

Roosevelt was a man who made quick decisions. Fort eight hours after he had received Stevens' letter of resi

ıtion, he cabled him that his resignation was accepted, ıt that he would expect him to remain on the job ıtil the new man arrived and then stay long enough r his successor to become familiar with the work.

Roosevelt knew that for every job, however large, some an was fitted. And if two men he trusted said that oethals was the man for building the canal, why then oethals should have his chance at it.

He lost no time in calling for Major Goethals.

* * *

It was about a week after Stevens' resignation had ached the President. Major Goethals and his wife were tertaining an old friend at dinner in Washington hen a White House servant arrived with an urgent mmons from the President:

THE WHITE HOUSE
WASHINGTON

February 18, 1907

My dear Major Goethals:

The President would like to have you come in and see him tomorrow (Tuesday) morning at half past nine. Will you please let me know if you will be able to come?

Very truly yours,
WM. LOEB,
Secretary to the President.

Goethals was amazed. He had no idea of what had en going on down in Panama, and there is no doubt

that the canal was far from his thoughts. Even if he had suspected something of the kind, he would scarcely have dared to hope for it.

He went straight to the telephone to let Mr. Loeb know that he would come. Imagine his surprise to discover that the President wanted him, if possible, to come over that very evening.

Dazedly he said he would come—yes, immediately.

There was a flurry of activity. He had to put on his dress uniform, for he was going to see the President. Then he hurried over to the White House, where the President was waiting. They shook hands, and President Roosevelt remarked on some of the many nice things he had heard said about the major.

Then it came like a bolt out of the blue. Stevens had resigned, the President told Goethals. This was a heavy blow, something the President regretted a great deal.

Goethals held his breath. Was it being offered to him—this, the biggest job in the world, the dream of every engineer who was really an engineer?

But Panama was not too pleasant a place, the President went on, in spite of the efforts they were making to clean it up and wipe out disease. It was not the sort of place where an American could be expected to stay for several years. It was only to be expected that there would be a change of men working on the canal, a change of engineers.

However, the President continued, one can't do a good b that way, nor can one build a good canal that way. equent changes of leadership would undermine the hole thing. He, the President, had decided to put the b in the hands of men who could not resign unless e desired them to do so. He had decided to give the ork to Army engineers.

Still Goethals held his breath.

Then the President told Goethals that the resignations d left him with two positions to fill, that of chief gineer and that of the head of the Canal Commission.

There was only one way to run the works efficiently—give both jobs to one man. And that man was Goethals.

The cat was out of the bag. So that was it—Panama d the canal. And it was his, all of it. The biggest job the world.

* * *

After that, for Major Goethals, there was a bewilder-g whirl of excitement. He was plunged into the job ithout any real preparation for it, and instead of the sk being carried on by private contractors, as had been iginally planned, it was to be done by the government th Army supervision.

When bids by big contractors for canal work were jected, an immediate protest went up from Wall Street. ne contractors complained that they were being cheated

out of their just dues. It never occurred to them th since the United States government was building th canal, it belonged to the people of the United State If anything, the government was making sure that tho people would not be cheated.

Withal, complaints came from everywhere about th Army's doing the work. It was hinted that all sorts severe and unnecessary discipline would go into th building of the canal, that the workers would be reg mented like troops.

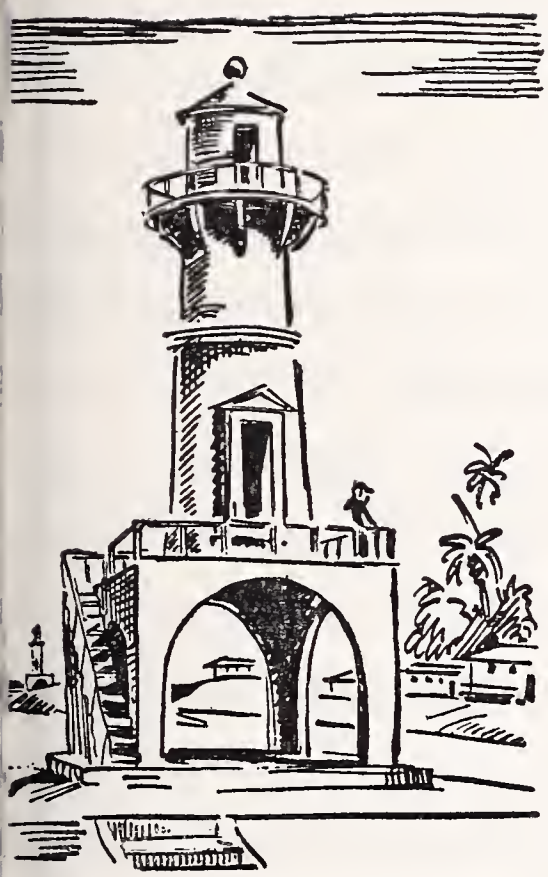
Goethals realized that his task would be no picnic.

For his assistants on the new commission, Goetha chose two competent engineers, both of them Arm men, Majors Sibert and Gaillard. His own promotio came through, he was now Colonel G. W. Goethal

He went ahead with preparations, ignoring the calan ity howlers. Let them say that it was another Frenc disgrace, that the whole project was destined to doon He knew what his work was, and he was going to do i

Soon the time had come for him to sail. About fift members of Congress were to accompany him to th Isthmus. Anyone else might have been dismayed by thi but Goethals took it in his stride and got along very we indeed with the congressmen. The trip was pleasa and uneventful, and late in March the boat steamed int the harbor of Colón.

Goethals had come to Panama and the job.



CHAPTER SEVEN

"Where Many a Man Had Died"

EVENS DID NOT WELCOME GOETHALS TOO GRACIOUSLY. anal work seemed to have worn out the railroad man; : was nervous and fretful, wanting, seemingly, nothing ıt to get off the Isthmus and back to the north.

But as Goethals went around on the preliminary in-)ection tours, he began to realize what Stevens had ced. He had heard that this was the biggest engineering b in the world, but hearing it was one thing and facing was another.

He had nothing but praise for what Stevens had done. he old, decaying Panama Railroad had beeen reor-

ganized and repaired, and now it was operating at very high point of efficiency. Traffic and freight wer moving with smooth orderliness, and the old roadbe had been set on a firm foundation.

The chief engineer was also commander of a hug army of workers. When Goethals arrived there wer more than thirty thousand workers at the Isthmus, an the task of feeding and housing these men, aside fro the work they did, was monumental.

Roughly the workers could be divided into two part the skilled and the unskilled labor. The unskilled wer recruited from the West Indies and Europe, and th skilled, for the most part, from America. For the time the wages were higher than was usual on most jobs o the kind. With the cleaning up of the mosquitoes, healt conditions were becoming better and better.

There was a multitude of skilled jobs: cranemen, loco motive engineers, steam-shovel engineers, carpenter plumbers, mechanics, railroad conductors, firemen, p licemen, clerks, nurses, doctors, civil engineers, draft men, surveyors—to mention only a few.

Some of these jobs were filled by civil-service em ployees; most were not. Altogether, the American worl ingmen were independent and, just now, questionin They were good union men, and they wondered wheth the Army taking charge would spell the end of the

inions. They waited with grim faces to see what attitude he colonel would take.

For the time being Goethals took no attitude; he bserved and he walked warily; and he filed away his mpressions of this and of that. He saw, for instance, that he railroad work was excellent. Well, Stevens was a good railroad engineer, and there was no reason why hat should not be so. He also saw that the lock work vas not so good. The wrong men on the job. This was o be a lock canal, and therefore much of the success of he canal depended upon the construction and strength f the locks. He saw that huge strides had been taken in ealth work, but that there remained much to be done. Well, it would be done. Colonel Gorgas was a good man, nd Goethals had no doubts about working with him.

But everywhere that Goethals went, when he first came n the job, he was regarded with suspicion and mistrust. The engineers and the workingmen resented and feared he Army. What would be his first move? Would he drive them to work with bayonets? Would he court-nartial them? Would there be no appeal from his orders, whether they were good or bad?

Goethals realized what their attitude was, and while ie resented their bitterness toward the Army, he couldn't nelp but see the justice of their fears.

* * *

The Corozal Club was an organization of trained men working on the canal. Soon after Goethals arrived they invited him to a dinner, supposedly given to welcome him, but actually so that they might have a chance to bare their hatred for the Army.

Goethals may have suspected what was coming, but deciding that he would have to accept such a situation sooner or later, he cheerfully accepted the invitation.

He took them rather aback when he appeared in civilian whites. They had been gearing themselves to plunge at a colonel in shoulder straps and gold braid and here they were facing this smiling man in white duck. However, they did not hold back for long. Every speech and every remark was a bitter slur upon Goethals or the Army. When Mr. Stevens, the retiring engineer was mentioned, the room broke into cheers. When Goethals was mentioned, the room sat in cold silence.

Another man might have been violently affected by this. His reaction might have been either hatred or bitterness or disgust. He might have marked down each man at the dinner as his personal enemy.

Goethals did not; Goethals sat and listened, and probably told himself: "These are the men with whom I must work. You can't work with enemies or hatred. I respect them because of their loyalty to the man who was their chief engineer; I must make them respect me."

Finally Goethals stood up to speak. He spoke quietly

n his soft, slow drawl. He didn't sound like an Army nan, but as an engineer talking with his men before a ard job. He spoke of the work they had done and the vork they were going to do. And he concluded with his:

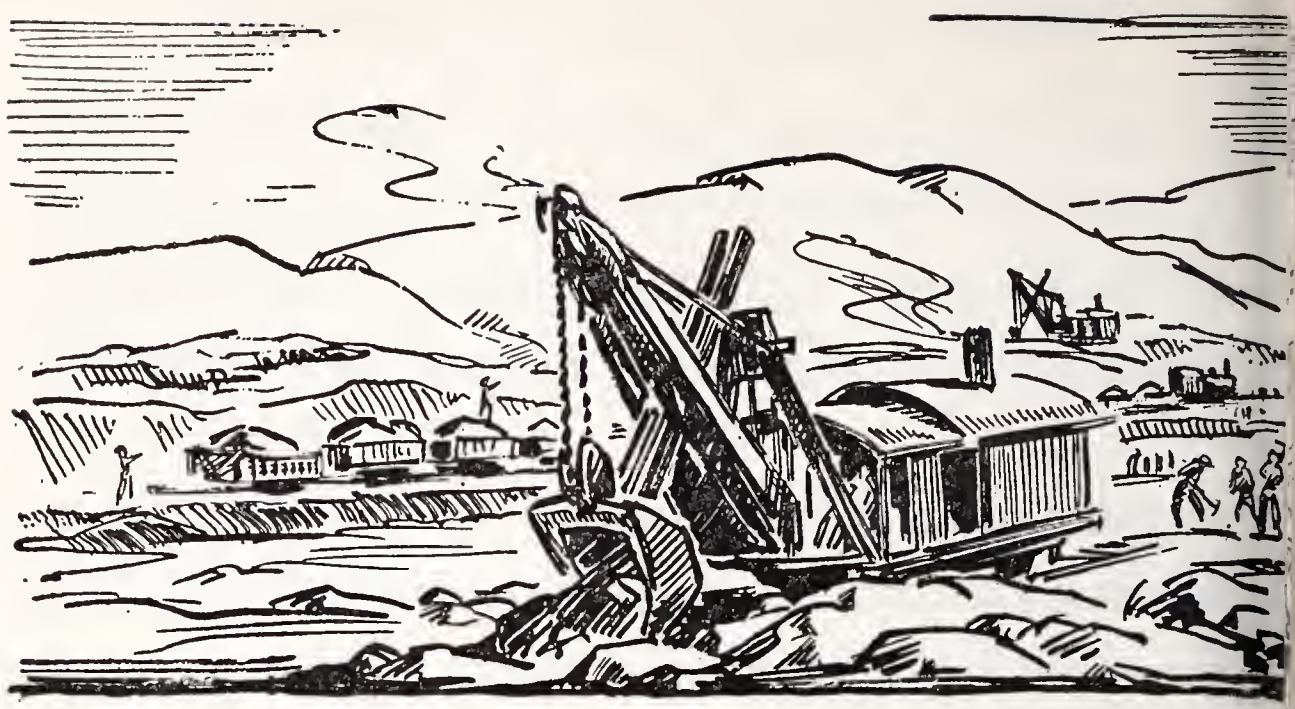
"I expect to be the chief of the division of engineers, vhile the heads of the various departments are going to e the colonels, the foremen are going to be the captains, nd the men who do the labor are going to be the privates. There will be no more militarism in the future than here has been in the past. I am no longer a commander n the United States Army. I now consider that I am ommanding the Army of Panama, and that the enemy ve are going to combat is the Culebra Cut and the locks nd dams at both ends of the canal. Every man who does is duty will never have any cause to complain on ccount of militarism."

It was a good speech, and it hit the right spot. At first nere was silence, then a little handclapping, then nore. . . .

Goethals had won the first round.

* * *

Before Stevens sailed from the Isthmus, leaving Goethals in full charge, an incident occurred that took way all bitterness between the former engineer and his ıccessor.



A party of congressmen, who had previously stopped at a port where there was yellow fever, arrived at Colón. Col. Gorgas, in charge of sanitation and health at the Isthmus, refused to allow them ashore until the quarantine limit had expired. The congressmen demanded to go ashore. They pointed out that they were congressmen and that they had no yellow fever. It was ridiculous to quarantine them.

Gorgas intimated that the situation would not be altered if the congressmen were kings; they would still be subject to quarantine. Health at the Isthmus was too important to allow anything to endanger it. And Stevens backed up Gorgas and Goethals backed up Stevens.

This showed the canal men that Goethals would not cater to politics, and it also brought him and Stevens together.

* * *

Finally Stevens left, and Goethals took the whole bi

n his teeth. He was at the job now, and the job was the biggest in the world. Not only was he in complete control of the Zone, but he had also been made head of the Panama Railroad. His control was absolute.

All that remained to be done was to build the canal. His existence previous to taking over work on the canal seemed like a dream. Now it was work all day long with never a moment of peace or rest, work on the canal, work co-ordinating the great army of men, work with supplies, work with shipping, with planning.

Secretary Taft arrived with three consulting engineers. The question concerned the locks, whether the rock foundation was any good. More discussions followed, and more. Social affairs had to be sandwiched in.

Next, a tour over the railroad was scheduled, with Goethals meeting the work gangs, seeing how the job was going. Soon the suspicion on the part of the workers turned to an attitude of:

"Let him show us. If he'll be decent, we'll give him a chance."

They were amazed to find that Goethals was very decent, a slow-spoken man who didn't presume to know everything. He would ask many questions, and his questions would drive to the kernel of the nut. He would move into a cut, watch a steam shovel at work, and know in ten minutes how much dirt it would scoop out in the next week. He would spot the weak point in a work gang and pull it together without hurting anyone's feelings.

The union men sent a delegation of steam-shovel workers and locomotive engineers to call on him. They felt that they justly deserved a pay increase and threatened to resign if it did not materialize. What was Goethals' decision about this?

When Goethals agreed with the justice of their complaints, adjusting what he could and arranging for a meeting with the Secretary of War, the word began to go around that "the colonel was not a bad egg."

Meanwhile, the colonel was discovering that he had to meet everyone, please everyone, and satisfy everyone—not only the canal men, but the Panamanians; not only the Panamanians, but the politicians from back home. He realized that in order to get any work at all done he must get away from social distractions. The focal point of the work was the Culebra Cut, and there it was that Goethals decided to go.

The Culebra Cut

Just a few more social obligations remained on the ıust list. They were seen to, and then Goethals was ble to break away and get into his real job. He moved ıto Stevens' old house at Culebra. Now he was at work.

* * *

Although America had owned the Canal Zone and ad had men down there for four years previous to oethals' taking over the job, it was not until June 1906 ıat final plans for the canal had been decided upon. hat was a little less than a year before Goethals stepped ıto the harness.

You will remember that the French had decided to ıild a sea-level canal, one without locks. While this ould have been a tremendously difficult task, it would ɔt have been impossible; what made it impossible with e French was the incompetence of their planning.

Not that the French hadn't considered a lock canal. had been suggested to them by some very eminent ıgineers, one of whom even planned for a canal such we have today. But headstrong old de Lesseps would ɔt listen to any plan other than his own, and the French undered despairingly through their efforts to dig a a-level canal.

In 1905, when our proposal to build the canal had ken concrete form, President Theodore Roosevelt cre-d an international board of consulting engineers to

formulate plans for a canal across the Isthmus. On thi board were some of the greatest hydraulic engineers i the world, who spent a year in completing their reports

They submitted two reports, and it is interesting t note the difference between them. The first, the majorit report, was signed by eight members, five of them for eign, and this favored the sea-level canal. The minorit report was signed by five members, all of whom wer Americans, and this favored the lock canal.

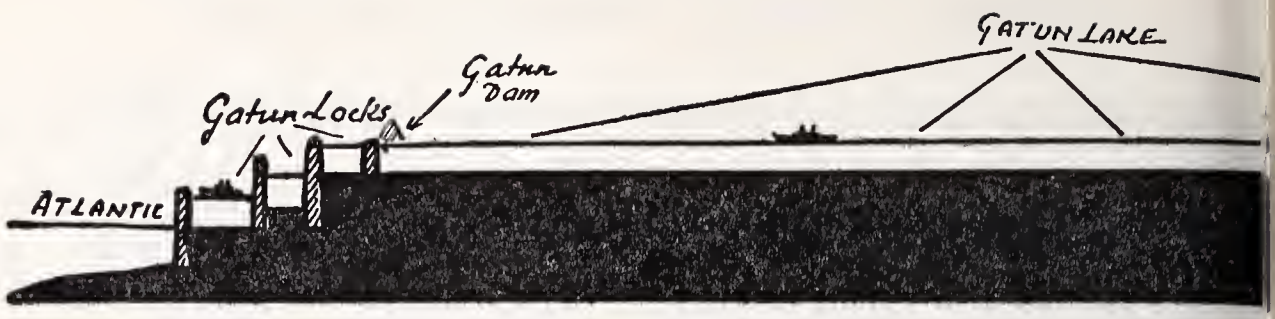
The interesting point is that the foreign experts wer in favor of the sea-level canal, while the American favored the lock type. This is the reason why: the loc type of canal could be built in half the time it woul take to build a sea-level canal, with half the effort an for half the expense. *But* the engineering difficultie would be far more complicated. And these complication of intricate engineering the foreign experts sought t avoid. They preferred the more expensive, more wear some, but simpler way. Theodore Roosevelt summed u the whole matter thus:

> A careful study of the reports seems to establish a strong probability that the following are the facts: The sea-level canal would be slightly less exposed to damage in the event of war; the running expenses, apart from the heavy cost of interest on the amount employed to build it, would be less; and for small ships the time of transit would probably be less. On the other hand, the lock canal at a level of eighty feet, or thereabouts,

> would not cost much more than half as much to build and could be built in about half the time, while there would be very much less risk connected with building it, and for the large ships the transit would be quicker; while, taking into account the interest on the amount saved in building, the actual cost of maintenance would be less. After being built, it would be easier to enlarge the lock canal than the sea-level canal. Moreover, what has been actually demonstrated in making and operating the great lock canal, the Soo, a more important artery of traffic than the great sea-level canal, the Suez, goes to support the opinion of the minority of the Consulting Board of Engineers and of the majority of the Isthmian Canal Commission as to the superior safety, feasibility, and desirability of building a lock canal at Panama.

This letter went to Congress in February 1906, and / June Congress had decided to build a lock canal at e elevation of eighty-five feet. This meant that from e point where the ship entered the canal, at sea level, would gradually be lifted, by a series of locks, to the ight of eighty-five feet.

It is important to understand this feature of the Panna Canal. Most people believe it to be a direct link tween the Atlantic and Pacific oceans, but that is not . There is no direct connection whereby the waters of e Atlantic and the Pacific meet. Rather, there is a landcked canal built upon the high back of the Isthmus, as own in the following drawing:



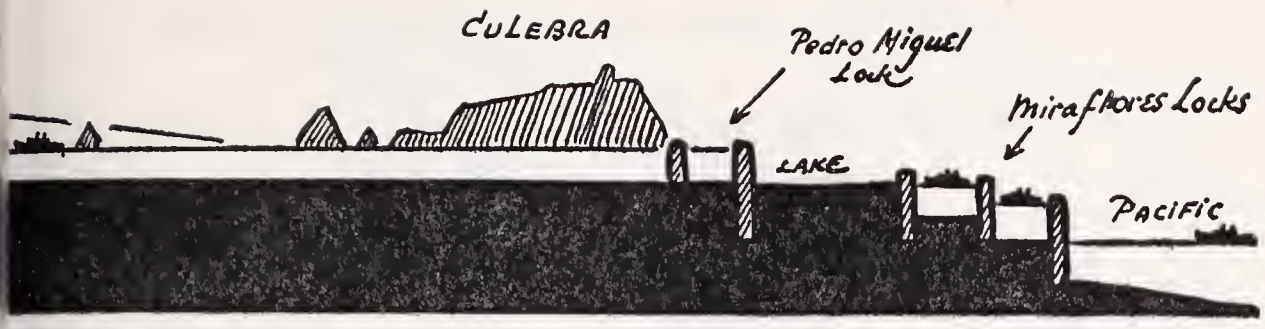
This is a man-made canal, but it does not connect th Atlantic and Pacific oceans. It merely covers most o the distance across the Isthmus, and at each end it i closed by a giant water lock. As you see in the drawing the oceans are far beneath. Had the original plan o building a sea-level canal been adhered to, the whol big plateau that you see in the drawing would have ha to be cut away.

The next point is this: if there is no connection betwee the Atlantic and Pacific oceans, then how do ships trave from one to the other?

Earlier in this book, it was explained how a canal loc operates. In a series of steps, it actually lifts the ship ove a hill. Turn to page 125 to see how that happens wit the Panama Canal.

The ship sails out of the Atlantic Ocean into a sea level channel. This canal is seven miles long, where i ends at the base of the Gatun plateau. Eighty-five fee above the sea-level canal is the main Panama Canal, bu before the ship can sail into this canal it must be lifte by three huge locks, or sea elevators.

Once the ship has been lifted to eighty-five feet abov the sea, it has clear sailing for almost thirty-two mile



n the canal within the Isthmus. Then, it must descend -this time to the Pacific Ocean, as shown in the drawing.

When the ship has steamed all the way across the thmus, it comes to the first of the Pacific coast locks. his is at Pedro Miguel, where a single lock lowers the ip thirty feet. At this side the locks are not all together, on the Atlantic side. After the ship has descended to e bottom of the first lock, it rests upon a little artificial dy of water called Miraflores Lake. This lake is a ile and a half long and is still some fifty-four feet above a level. From the lake to sea level two more locks lower e ship. All that remains now is for the ship to proceed rough a sea-level channel similar to that on the Atlan- side. This channel is eight and a half miles long.

You have now seen how, with the lock system, a ship actually passed over a bridge from the Atlantic to the cific oceans, or vice versa. Now that we know, to a rtain degree, what had to be done by Goethals to build canal across the Isthmus, we can go on with the in- merable problems he had to solve. First, on either side the Isthmus, a long sea-level channel had to be dug. hen, on either side of the Isthmus, three great locks d to be constructed.

Building the sea-level channels was a routine job o digging and dredging that any canal man could hav done. No large complications were looked for. The lock were a much more difficult proposition. It was necessar for these great sea doors to operate with the precisio and accuracy of a handmade watch, yet they had to b strong enough to contain the water that floated an ocea liner.

There would be work and trouble and complication enough connected with their building, yet even they wer in no way so difficult as the problem presented by the bi interior canal. Remember that the water level of thi main division of the canal was to be some eighty-fiv feet above sea level. If there were simply a flat platea across the Isthmus, through which a thirty-two-mil canal had to be dug, the problem would not contain to many "bugs," as they say in engineering.

But the interior of the Isthmus was not by any mean flat. For one thing there was the Continental Divide You may have heard this Divide referred to as existin in America or in Canada. It does.

But you may also think of the Divide as the backbon of the combined continents of North and South America for that is what it is. This backbone, or ridge, starts dee in the frozen north of Alaska, runs through Canada through the United States, through Central America through the Isthmus, and then through most of th

II.
I.
III.
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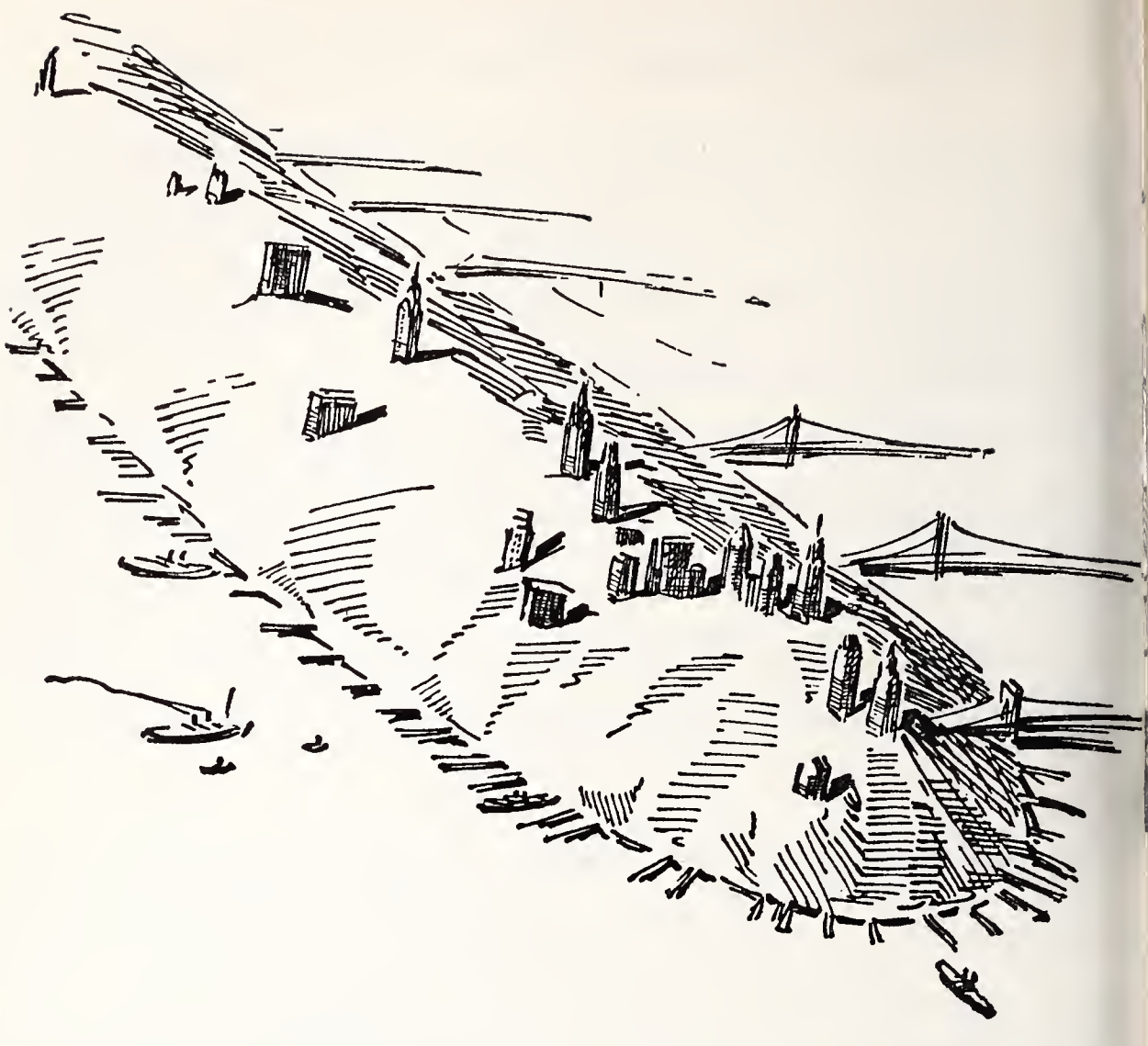
ngth of South America. In the United States it is rmed by the central peaks of the Rocky Mountains, d if you drive from New York to California, you must oss over that Continental Divide.

This same Continental Divide proved the greatest stacle to the builders of the Panama Canal. On the thmus, the great ten and twelve-thousand-foot peaks the north had lost most of their height, and the Divide uld be measured in hundreds instead of thousands of et.

The point where the Divide formed a backbone to e Isthmus was called the Culebra Cut. This Culebra ction was about nine miles wide, little peaks and tum- ed hills that had to be cut through before the dream a canal could become reality. Perhaps it was these ry hills that Balboa climbed to see the Pacific Ocean. On page 128 is drawn in cross-section a sketch of these lls that had to be cut away before the canal could run rough the Continental Divide. Remember that this in the central, thirty-one mile section of the canal.

It is almost impossible to realize the task that the canal ilders faced at the Continental Divide. Altogether, ,132,801 cubic yards of dirt had to be excavated. The ctures that follow will give you a more graphic con- ption of digging that had to be done than any words uld.

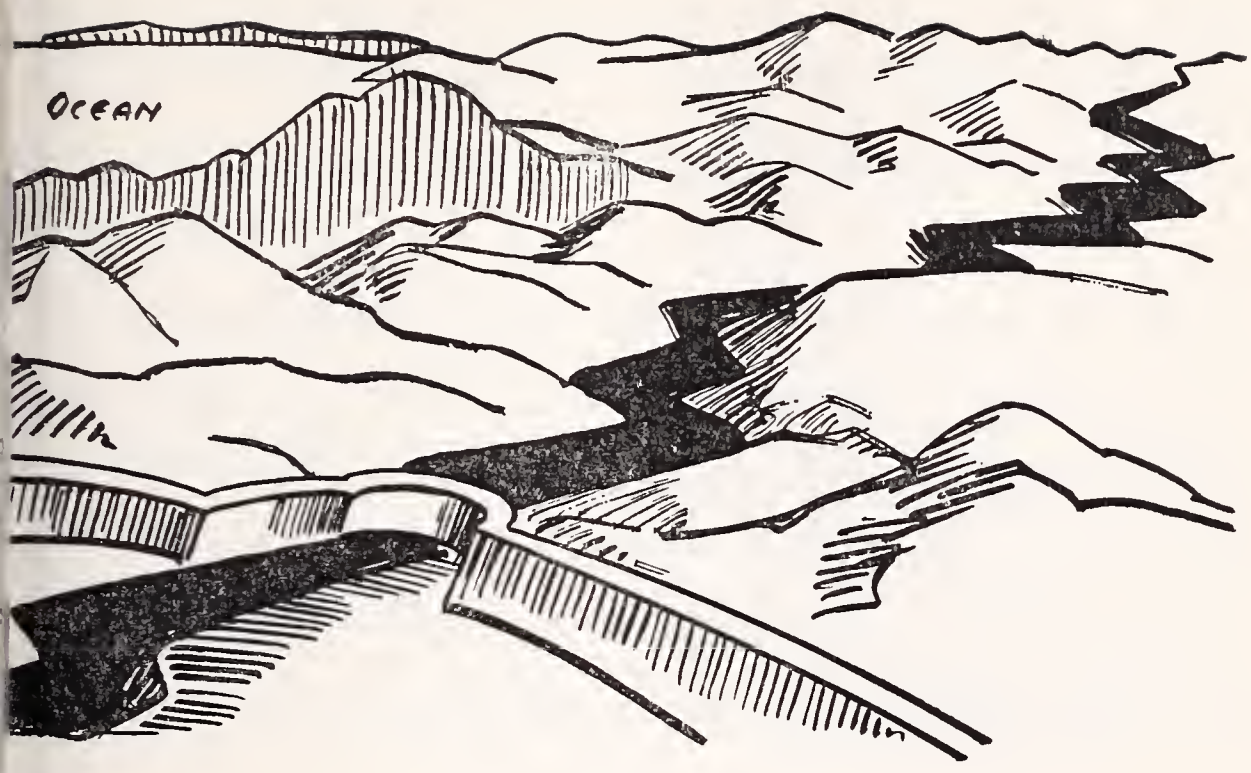
The other problem in the central section of the canal



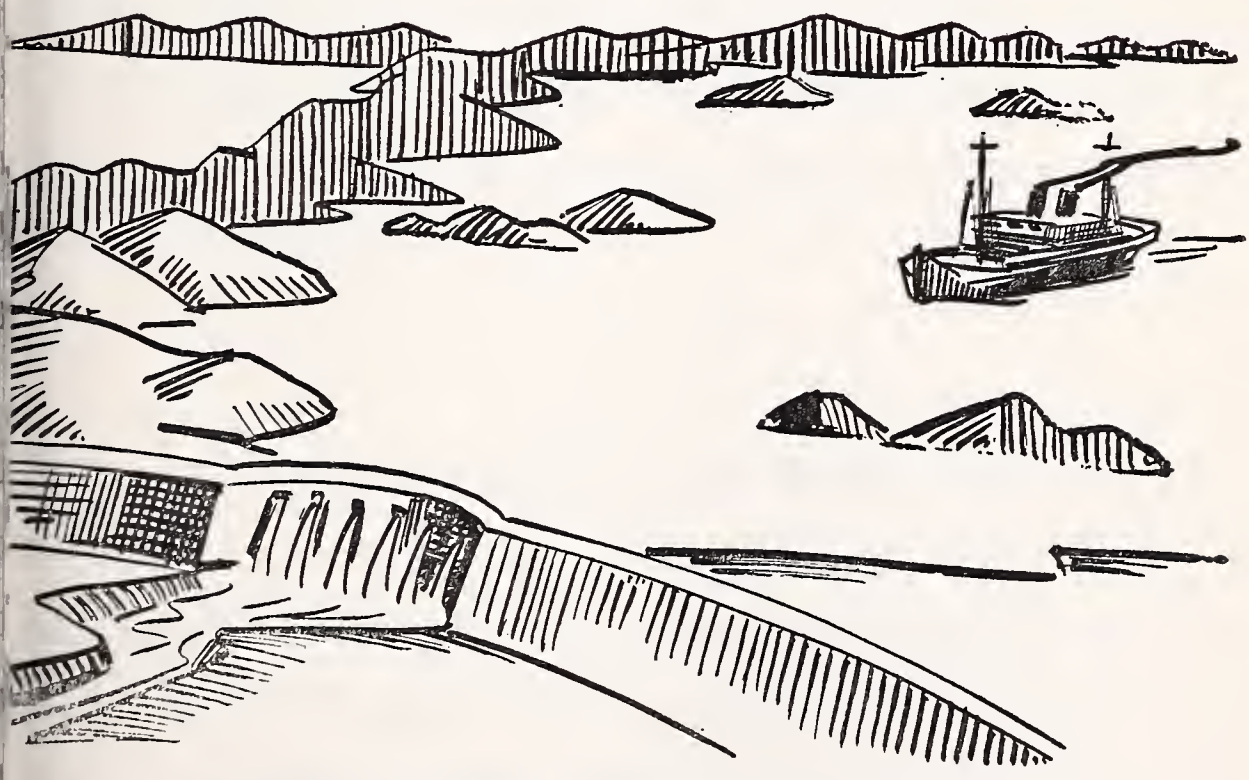
was what to do with the part of the plateau that was s
much lower than the Divide. Of course, the notc
through the Divide could be cut deeper and deeper, bu
this would mean years of work and a tremendous cos
The other alternative was to bring the Continental D
vide down a certain distance and the water level of th
rest of the canal up a certain distance.

As you remember, one of the old methods of crossin
the Isthmus was to follow the course of the Chagre
River. This river, rising in the interior of the Isthmu
flowed into the Atlantic Ocean. On the next page yo
will see a sketch of this river before work on the cana
was finished.

"Now," reasoned the canal designers, "suppose th



Chagres River



The dam changes the river into a lake

tlantic end of the Chagres River were to be dammed p? Wouldn't this cause the river to backflow and flood ıe whole of the interior plateau right up to the Con- nental Divide?"

The idea sounded good, and plans were made to build ıch a dam. The dam would change the Chagres River ıto a great lake, and through that lake dredges would rag a channel for boats to follow. In the sketch on page 29 you see how the dam changed the river to a great ke, and you see the path of the channel through this ke.

As you see by comparing the two sketches, after the ıilding of Gatun Dam, almost the whole interior of e Isthmus became a huge lake. The surface of this lake as to be eighty-five feet above sea level. Where the lake as naturally deep enough, ships could steam freely, d where it was not deep enough, channels for shipping ere to be dredged.

* * *

Now, to a certain degree, you have been given a rd's-eye view of all the contemplated work on the nal. You see the problem much as Goethals saw it ıen he took the reins of the big job at Panama.

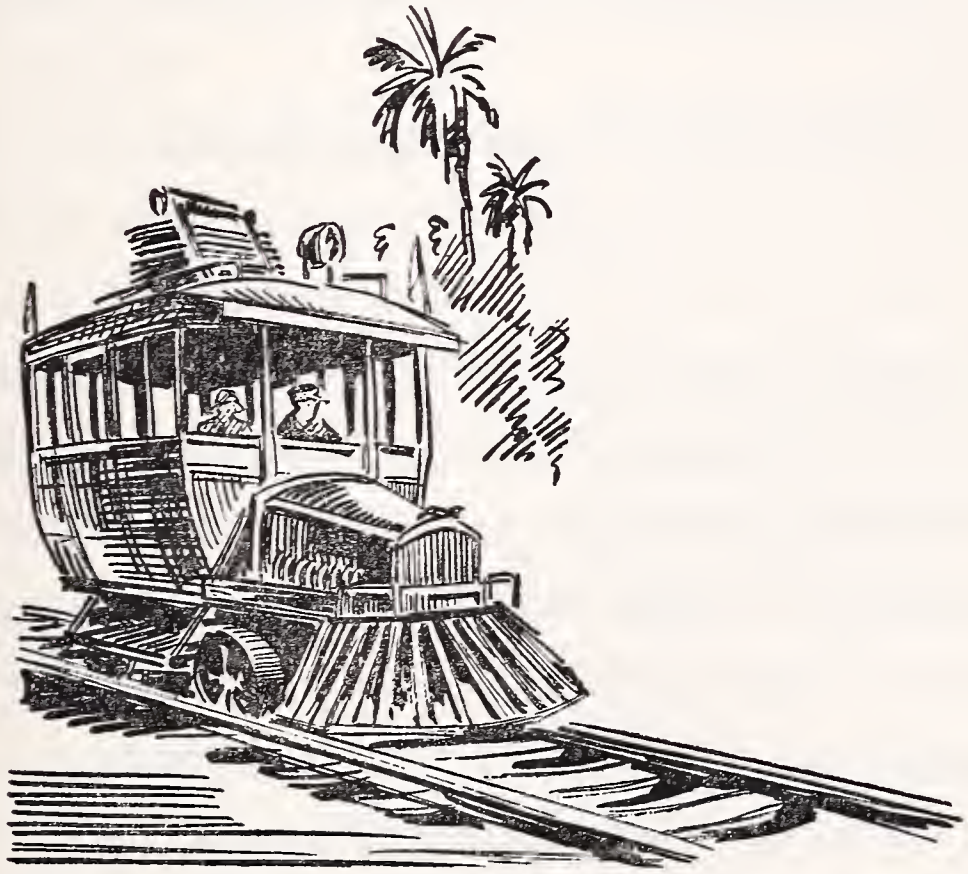
When Goethals became chief engineer, the sea-level nals were still incomplete. None of the locks had been ilt. Only a tiny fraction of the total required amount

of excavation had been done at Culebra, and work o
the great Gatun Dam had only just started.

Goethals looked ahead to years of hard work. Knov
ing what he had to do, he rolled up his sleeves an
pitched in.

CHAPTER EIGHT

To Slit the Sliding Mountains and Lift the Eternal Tide"



IN THE BEGINNING THERE WAS OFFICE WORK, OFFICE WORK
piled sky high. Goethals gritted his teeth and tackled it.
The canal force was a huge machine. From the Atlantic
to the Pacific, in the cuts, in the excavations, on the dams,
in the yards, in the factories, thousands of men were at

work. This great machine had to be put into smoot running order; it had to be oiled.

Goethals was doing the oiling in his office, growlin about it, longing to be out in the field. But he held his purpose from seven-thirty in the morning until te at night. And still there was work to be done!

He had had big jobs before, but this was such a job to make them all child's play. He had no time for rea ing; he couldn't think about anything but the cana Slowly, unconsciously, he was integrating himself wi his work.

He and the Isthmus were becoming one.

* * *

He began to get some order into his office materia and now he felt that he could go out along the line an dip his hands into the construction work. He was lik the mother of a huge household, who, having put h accounts in order, feels that it is now time to set abo cleaning up.

First he decided to spend alternate days seeing to son part of the outside work. But he soon found that it w better to put in mornings on the actual construction an afternoons in his office. There was the business of gettin around. Back in the States, an engineer on an extensi job used a horse for his field trips, and Goethals ha

ken a horse down to the Isthmus. But he soon found it be more of an inconvenience than a help.

What he needed, chiefly, was speed in getting from ıe place to another. As the railroad generally paralleled ıe course of the canal, he took to riding whatever piece rolling stock was handy. There were three gorgeous ivate cars left over from the days of the French fizzle, ıd sometimes the colonel rode one of these. However, was not particular. He just as happily rode a caboose, crouched in the cab with the engineer of one of the onkey engines.

When he saw something interesting, he would leap f without even telling the engineer to slow down, and was a not uncommon sight to see the colonel come mbling off a locomotive, down the rubbly sides of a ıt! Later on the colonel devised a motorcar that ran ı the railroad tracks. It was painted bright yellow, and lled, among other things, the "Yellow Peril" and the Brain Wagon."

Out on construction work he put dignity aside. When scrambled up and down the cuts, the whiteness of s trousers soon disappeared; he was the engineer then, ot the Army officer. No one could ever tell where he ould turn up. Slackers began to resent the fact that ıe colonel had no regular tour of inspection. He might sit the same cut five days in a row, or he might not

appear in the field in a week. No one ever knew whe or where to expect him, and as a result of this the qualit of the work as a whole went up.

Most of the men had made up their minds not to lik Goethals. Grudgingly they found themselves respectin him; then their respect turned to admiration; then thei admiration turned to whole-hearted affection.

He knew his job. It didn't matter that it was the bi gest job in the world; he knew every inch of it. He wa not dogmatic; he was willing to be shown and willing t be told, and his decisions were very just. There wa nothing of the snob about him. When he walked int some out-of-the-way commissary mess and sat down wit the steam-shovel operators and the diggers for a thirt cent lunch on an oilcloth-covered table, he was n condescending. He was on the job; so were the digge and the shovel men. He ate with them and talked abou the job with them, nor did it occur to him that th might have been otherwise.

Joseph Bishop tells these two stories of the early da when Goethals first took over. Goethals, having decide to ride out to a point on the job in a railroad daycoac took a seat next to a grumpy canal worker, who, seein that Goethals was a good listener, began to talk.

He was fed up with his job, the stranger said.

Goethals smiled and nodded and asked why.

Well, the Army for one thing, the canal worker sai

ɔinting out that with Colonel Goethals life would be
ıe very devil. As for himself, he was through. He had
ɛen offered a job in Ecuador, and he was getting out.
Goethals smiled and nodded and listened. They got
f the train together, and the canal worker noticed men
ıapping to attention and saluting the white-clad figure.
"Say, who is that guy?" he demanded of a steward.
He was told. But Goethals was still smiling and affable,
spite of the fact that the canal man had lied about
s salary.
The other story concerns a health officer who was half
ı hour late on the job. Goethals had come into the dis-
ict health office on the stroke of eight. The health officer
ould have been there, but it was fully half an hour
fore he arrived.
"Why are you late reporting for duty?" Goethals
manded.
"I was out inspecting my district, sir," the health officer
ıswered.
"Where?" Goethals demanded coldly.
"The garbage dumps over in Guachapali, sir."
The man wore white duck trousers, immaculate and
atly pressed. His canvas shoes were newly whitened
d there was not a stain upon them. As Goethals stared
the trousers and shoes, everyone recalled what a mess
slime and filth the garbage dumps were.
But Goethals didn't accuse the man of lying; he simply

said, "The next time you are half an hour late gettin down to work, see that you have a more convincin excuse."

The men learned that he was a hard taskmaster, but just one. They learned that he was honest and sometim tactless in his honesty.

The first few months after Goethals took charge we the hardest. The great canal organization was like a wil horse he had to tame. Men who had been grafting no found they could no longer graft. Men whose work ha been easy now found it hard. But the canal was beir built.

* * *

There was just one more thing that Goethals felt l needed, and that was absolute command of the who situation at the Isthmus. Whether he was right or wro in this, we can't say, but he sincerely felt that this job w no different from other jobs he had directed. On oth jobs he had full command of the situation, and l wanted as much here. In many letters he told this Roosevelt.

Theodore Roosevelt's mind worked the same wa Above all other things he wanted the canal built, a he felt that Goethals was the man to build it. Bit by l he concentrated more power in Goethals, until fina

e colonel ruled the Isthmus as completely as one man ay rule a piece of land.

It was fortunate, not only for the men who worked ere, but for all Americans, that Goethals never abused at power.

* * *

The job was on, and we come now to the building, e digging, and the dredging that went into making the nal. As we said before, the work could be divided ughly into three large parts.

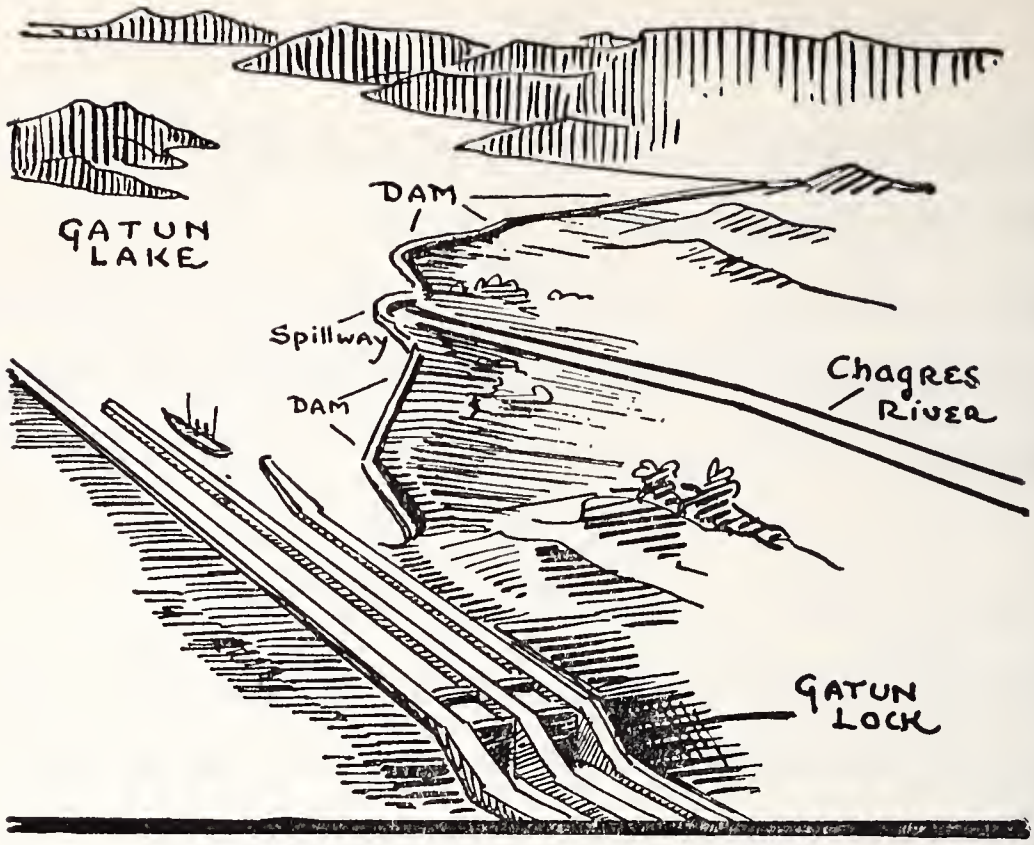
First, the Chagres River had to be dammed up and ade into a great lake.

Second, the Continental Divide had to be hewn trough—a nine-mile ditch dug into the Culebra Cut.

Third, the locks had to be built, those great water evators that raised and lowered the ships from ocean t ocean.

All three divisions of work went on together, though ey must be described separately, and Goethals had to come a man with three minds, a man in all places at ce.

Two of these parts of the canal work linked up, the at Culebra and the dam at Gatun Lake. For in the nths immediately after Goethals came on the job, st of the millions of square yards of dirt dug out of



Bird's-eye view of Gatun Dam

the Continental Divide were used to build the Gatu
Dam.

You can see in the map how the Chagres, coming o
of the jungles, flows toward the Atlantic. Near the coa
it passed between two low hills, and it was decided
throw a dam from hill to hill, and back the river u
over the whole of the central plateau.

Some dams, such as the Boulder Dam in Colorado, a
constructed almost entirely of concrete and steel.
simpler and cheaper method was used at Gatun, althoug
it was a method that would not work everywhere. B
tween the hills two parallel ridges of earth were throw
up, with a space between them. This space was to b
filled with a sand and clay mixture pumped up fro
the bed of the Chagres River. As the water drained o
the sand and clay mixture would settle and becon

most unbelievably hard. The result would be a barrier
ıite as sturdy as a concrete dam and as permanent as
ıe hills it connected.

Of course this was sound engineering. When Goethals
ıme on the job himself, he ran test drills; and he agreed
ıat the dam, once built, would stand as long as the hills
ound it.

But there were others who thought differently. People
ere seeking for some spot in which to attack the canal,
ıd they found that spot at Gatun. A certain engineer,
ɔing a test drilling, used a drill bit that chopped right
ıough the underlying sandstone. As a result, the sam-
es brought up by him were mashed as fine as gravel.

He was not long in spreading the story that Gatun
am, when built, would stand on nothing firmer than
ft gravel. It mattered not that Goethals sunk test pits
his own and found that the dam would rest on very
lid rock. It mattered not that every engineer working
ı the job testified that the dam was a very sound job.
he reports persisted and went from bad to worse.

People said that the dam was being built on sand,
ıd then on quicksand. They even said that the dam was
ing constructed over a huge underground lake. Gatun
am became the focal point of every attack on the canal.
o story was too fantastic to be told about Gatun.

At that time few journalists paused to document what
ey wrote before they sent the story in to their papers.

A school of what was called "Yellow Journalism" ha arisen, actually a means of boosting the circulation papers by printing fantastic and sensational stories. Or of these papers sent a reporter down to the Isthmus have a look at the dam. He found a slight slump on th north side of the fill, something that the engineers ha expected and for which they were already providing. N a drop of water in Gatun Lake was leaking through, an Goethals had already taken measures to even up th slump.

But the reporter saw his chance and seized it. H dashed to the cable and wired a story that appeared o the front page under the following headlines:

COLLAPSE OF GATUN DAM

Chagres River Plunges Through Gap In Isthmian Wall. Engineers Face Problem.

Goethals didn't stoop to a battle with the reporter the newspaper; he went ahead with building the dan

Since the canal was to be a lock affair, the depth the water in the central section would have to be consta all the time. This meant the building of a spillway i the Gatun Dam, one that would take care of any amou of water brought down from the hills by floods. Th concrete crescent that formed the spillway was eig hundred and eight feet long; from this you will ha some idea of the size of the dam itself.

* * *

The greatest task of the canal builders, by far, was
e cut through the Continental Divide. To this day,
hen some monumental task is projected, it is compared
th the Culebra Cut. Nine miles wide, the Divide
ared up like the spiny backbone of some prehistoric
nosaur.

This Continental Divide formed the farther shore of
atun Lake. The canal would be cut through the Divide,
d then when the Gatun Dam piled back the waters of
e lake, they would run through the steep sides of the
ulebra Cut, forming the central section of the canal.

Two types of excavation were used here, wet and dry.
ost of the dirt was taken out of the cut by dry excava-
n, with steam shovels and cranes. Wet excavation is
edging, and that came later at the time when water
is let into the cut.

As to what the Culebra Cut was like—well, picture V-shaped cleft, as high as a twenty-story building an miles long. Picture men digging in this cleft year aft year. Great steam shovels grind and gnaw at the roc and dirt.

Spur lines from the railroad branch out—here, the and everywhere. Little donkey engines puff back an forth, dragging rock and dirt. Men scramble over th dirt walls like insects. All day long, from sunrise t sunset they dig, and still they seem to make no impressio upon the mighty mountain they are trying to carve i half. Loads of dirt are carted away until the tally shee can no longer hold them. A million cubic yards a nothing; ten million cubic yards are nothing.

Slides!

They have been digging in one spot for weeks. Slow the cut deepens, ten feet, twenty feet, thirty feet. Resul are beginning to show, and the men are proud of the work and achievement. Certainly, this piece of excavatio will be a record breaker; no other gang has done as we Everyone, from the foreman to the shovel engineer, grinning with satisfaction.

Then there is a slight trembling of the earth, a ominous shifting. Someone shouts a warning and poin up at the side of the cut.

A slide is beginning.

They scramble to safety, and with an ominous roar th

Slides!

side of the cut slips away, filling with dirt and rock the place where they labored for weeks. No one grins now and no one speaks. Instead they stand and mutely regard the ruin of their labor. Even the steam shovel is covered with dirt. They will have to dig that out now—with their hands.

Someone has sent for the colonel. They stand in grim silence waiting. Then they hear the sound of that familiar putt-putt-putt. The "Yellow Peril" comes into view, and soon the tall man in white is scrambling over the dirt.

"It looks terrible, doesn't it?" the foreman says.

"It could be worse," the colonel grins.

"What are we going to do?"

"Only one thing to do," the colonel says. "Dig it out."

If things were bad in the dry season, they were ten times worse in the rainy season. The torrential rains, pouring down the sides of the cut, turned the bottom of it into a black soupy mess. Men toiled knee-deep in this mess. The job had to go on. Working all day, the men lost all appearance of human beings. Brown from head to foot, they looked to be walking masses of mud. Everything sank into the mud: tools, steam shovels, cranes. And from the sides of the cut, gluey masses of mud slipped down, like molten lava, to further complicate matters.

Even the "Yellow Peril" became stained completely

dirty brown, and sometimes men were hard put to recognize the colonel. He would climb and slip down the side of the cut, and by the time he reached the bottom, he would be no different in appearance from them.

But his smile would still be ready, and his voice would make the mud fly faster.

* * *

Part of the Culebra Cut existed before we ever started to build a canal. In 1882 the French began excavations on the Continental Divide. One wonders how they ever hoped to dig the great cleft down to below sea level, when all they did in the years up to 1903 was to scratch the surface. When the Americans took over the job in 1904, they found the rusty French side excavators still standing in the cut. These excavators were not much good, although several were repaired and put to work. One by one they were replaced by giant steam shovels.

At that time the steam shovel was still a fairly new innovation in engineering. These monsters, which could pick up at one scoop more than a man could shovel in twelve hours, were the wonders of the world, and every newspaper was filled with stories of the shovels of Panama.

But for all the power of the shovels, the transportation system, by which the dirt was hauled from the cuts, was so antiquated that work had to be stopped. The spur lines from the old French railroad were so rotten that they

were falling to pieces. A whole new railroad system had to be constructed before the Culebra work could really be gotten under way.

Stevens, who was first of all a railroad man, undertook the construction of this railroad, and by 1907, the time when Goethals took over, it was complete.

You will remember that in the French attempt to build the canal they did just about as much excavation as they had done at Suez. That was a tremendous amount of work and a tremendous lot of dirt, yet when Goethals came on the job the cut at Culebra had barely been started.

Suppose you could have sat on a very high tower and watched the slicing through of the Continental Divide. What would you have seen?

First, you would notice a line of hills, about nine miles wide. A scratch runs through them, and in this scratch are hundreds of little figures that look like ants. They are so tiny that you wonder what impression they could ever make on those hills. If you sit and watch them for a long time, you will notice that very, very slowly the scratch grows deeper and deeper. The little figures appear to move about aimlessly, but withal there is method to their work.

They are pecking at the sides of the scratch. It is doubtful whether you have patience enough to match theirs. Day after day they scratch away, yet their scratching

seems to have little or no effect. You see long strings of dump cars drawn by little locomotives; you see them loading bits of earth on those dump cars.

Then you see the locomotives chug away, dragging the dump cars filled with dirt. The locomotives chug on until they come to a place between two hills, and there they dump the earth they have dug out of the Continental Divide. This is the Gatun Dam.

Look back at the Continental Divide, where the little black figures are still scratching away so tirelessly. You notice that one of the hills is higher than all the others, and here there are more little figures than anywhere else.

This is Culebra. This is where a great mountain must be sliced in half, so that ships from the broad ocean may sail through. But when you hear that is what they are trying to do, that the tiny black midges are trying to make a path through the mountain, a path where ships may sail, you smile at the foolishness of the whole idea.

How can such a thing be? They have been pecking away for years. Endlessly, their toy trains carry away dirt and more dirt and even more dirt from that mountain, and still they seem to make no impression. Why don't they give up? Why must men dream of such things, of ships sailing across the backbone of a continent, from ocean to ocean?

You close your eyes for a while, and when you open them, you see that the scratch in Culebra has partly filled

ıp. There has been a slide and their work is wiped out. ;urely they will give up now. But no—they are at work gain, scratching tirelessly.

But you lean back and sleep on your lofty perch, and a ear and two years and five years go past. Then you open our eyes again. What!—are they doing the same thing? Are they still scratching away, after all these years? And till no further advanced?

But now you notice a distinct difference. The scratch ıas become a definite cleft—deep into the earth—at Culebra, so deep that the little midges are working far ɔeneath the surface of the earth.

You decide to abandon your airy isolation, and you swoop back to earth. Suddenly the silence is gone, and all s noise and activity. The tiny midges become sweating nen. Foremen roar orders. Locomotives belch steam. Steam shovels gulp with a hoggish appetite that is never atisfied. Smoke and dirt and dust fill the air. What giants these shovels are!

You stop to talk a minute with a dirt-grimed foreman, who is willing to give you a moment or two of his time.

"Big shovels," you say.

"None bigger!" The foreman grins.

"Do a lot more work than a man—"

"More than a few hundred men!"

You stop to digest this and then ask, "About how

many pounds would one of those shovels pick up in a day?"

The foreman does a little figuring and then answers "About six million pounds in an eight-hour day, that is if you don't work the shovel hard."

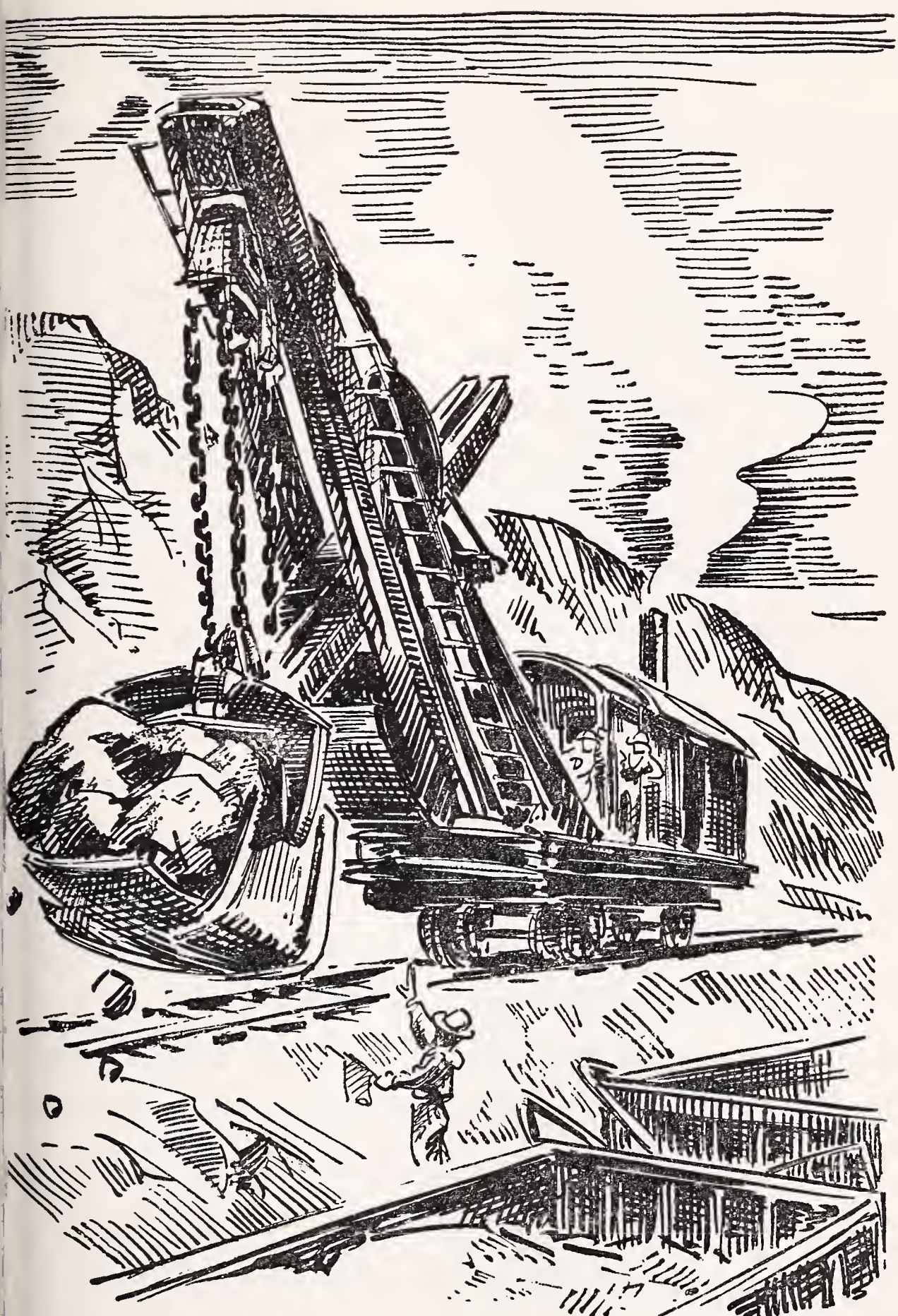
You shake your head and find this very hard to believe. From your high perch, you have watched this going on for years and years. Finally you say to the foreman "About how much dirt have you taken out of here all together?"

The foreman patiently says, "Look, son, we done enough digging here to dig a canal ten feet deep and fifty feet wide from Maine to Oregon, and there'd still be enough left over to dig a well for every man, woman and child in New York City."

* * *

Building the Gatun Dam presented Goethals with a tough job, and cutting through the Divide at Culebra was even tougher; but perhaps the most difficult job of all was building the six flights of double locks to raise and lower ships from ocean to ocean.

The difference between the locks and Culebra was the difference between the ditch digger and the Swiss watchmaker. For the watchmaker effort is measured by skill and precision, not by force or power. And the locks con



"None bigger!"

tituted as precise and delicate a mechanism as the finest wiss watch.

Simply stated, locks are water gates. The principle is ot at all difficult to understand, and it has already been xplained. The ship moves into the space between two airs of gates. The gates are closed. The water level is aised or lowered as desired. Then one pair of the gates is pened and the ship moves out. Stated that way, building ix pairs of double locks seems simplicity itself.

But the locks for the Panama Canal would have to accommodate the largest vessels afloat, especially the battleships of the United States Navy. That meant that the ength of each lock must be a thousand feet, or a fifth of a ile. And since three locks constituted a stairway to raise r lower a ship eighty-five feet, the sides of the locks ust of necessity be the height of a six-story building. he width of the lock would be one hundred and ten et, the width of a broad avenue.

And the gates—well, they would be just about the rgest gates in the world. The gates of the largest of the ncient cities would be dwarfed by the gates of the canal. he gates of Troy and Rome and Carthage would look ke the openings of hen houses. If you live in the average x-story apartment house, picture two gates, each one the ze of the front of your house.

Yet these gates had to swing as easily and as gently as ny well-oiled door. And since all of the locks were to be

built in duplicate to permit passage of traffic in both di rections, there would be twelve locks to fit with gates.

Was there ever such a labor of Hercules since th world began?

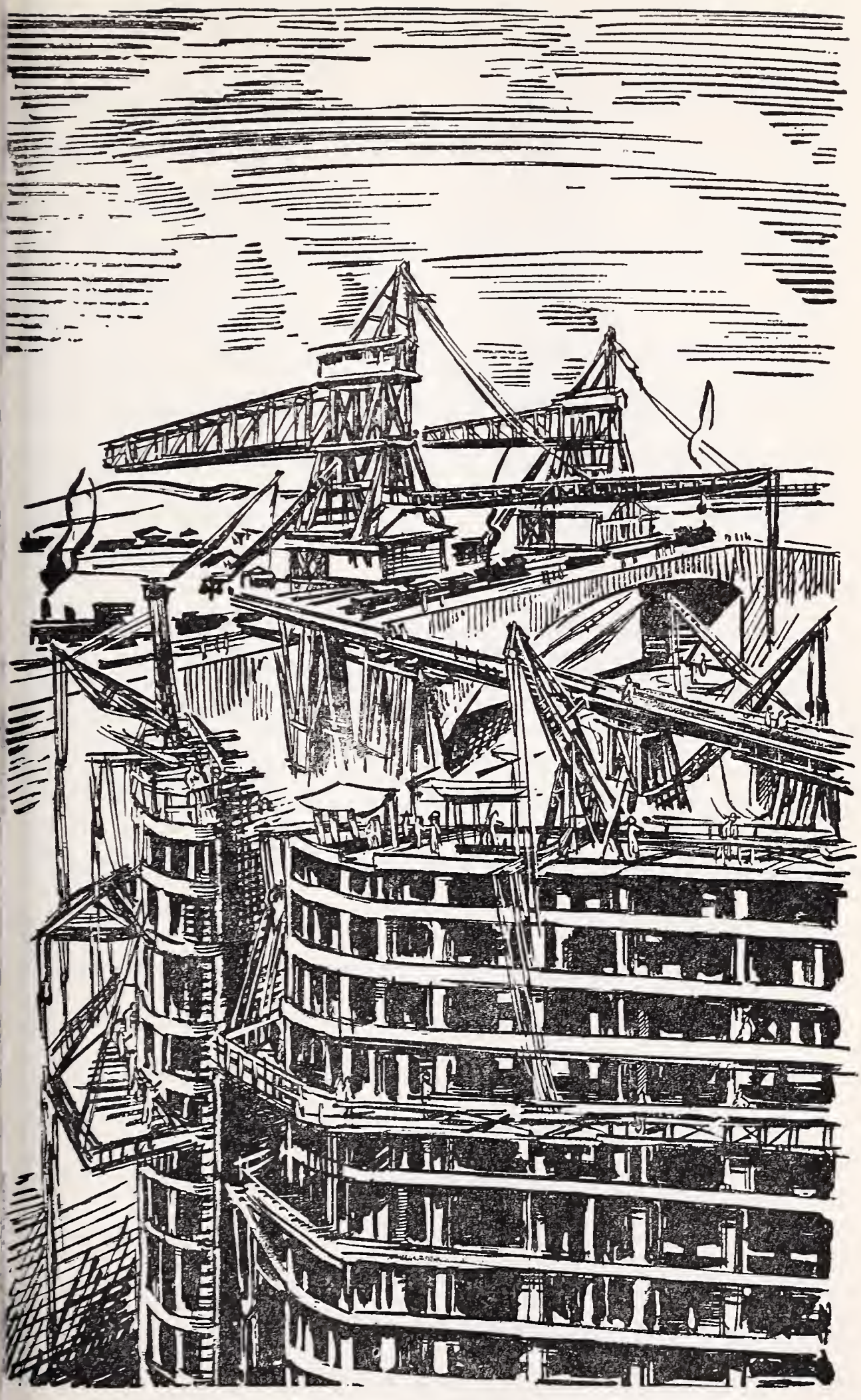
It is said that a man may be measured by his assistants Goethals was chief engineer, also governor, judge, an police chief of the Canal Zone. The big job was his, bu also a thousand small jobs. If he had set about buildin the locks and the gates, he could have done nothing else

It was easier and wiser for him to find the right ma to build them; and he found that man—in Harry F Hodges.

Men remember Hercules, who was given some difficul tasks to do, cleaning huge stables and such. They hav forgotten Hodges, a great sculptor of steel and concrete who was also given a task.

He was told to build gates, just forty-six pairs of th largest gates in the world, each seven feet thick, sixty-fiv feet wide, and from forty-seven to eighty-two feet high Incidentally, he was to install valves in the system of con duits that raised and lowered the water level in th locks, set up and put in working order the elaborate ma chinery that would open and close the gates and th valves. Incidentally, again, he was to make sure that th Chagres River, harnessed by Gatun Dam, provided a the power for this.

Hodges was not the sort of man who talked about



A labor of Hercules

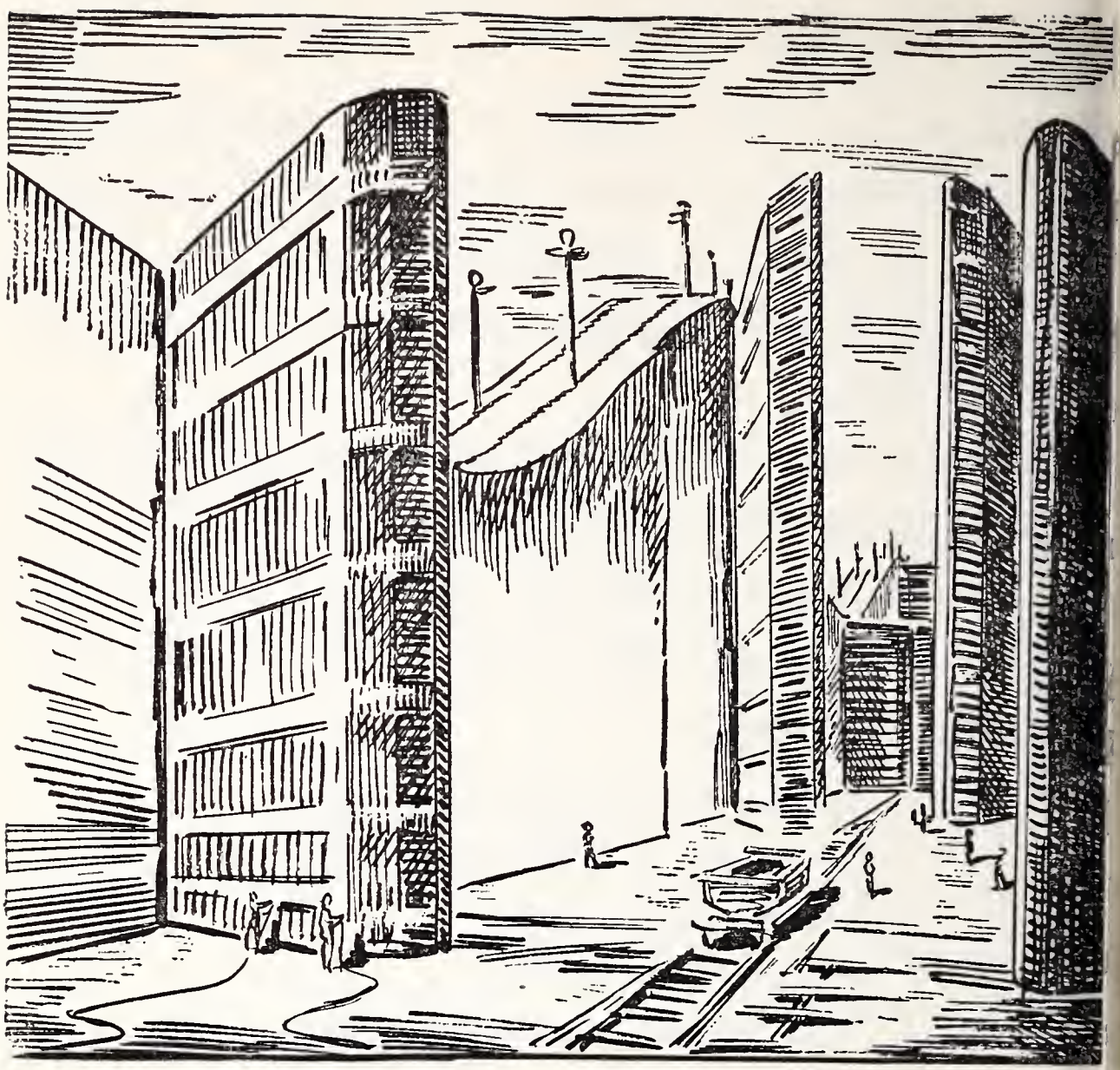
ɔb, and perhaps that is why his work has been almost ompletely forgotten. But on him depended the entire uccessful operation of the canal. Given a job, he set bout doing it, and if things were too complicated, he implified them.

It is due to him that the biggest ship can pass through lock in about fifteen minutes and through the entire anal in from seven to ten hours. Here is a limerick that ɔmeone wrote about this very fine engineer. In a way, 's the best of praise:

> Assistant to Goethals is Hodges,
> In a house on a hilltop he lodges,
> His morals are nice,
> His manners precise,
> And humor he carefully dodges.

He dodged the world too, but he built the gates. They ıight have been the gates of Limbo, that never-never ınd which hangs between Heaven and Hell; for in ıose days, when the locks were empty, vast vaults of ɔncrete a thousand and more feet long, the great gates ere the entrance to something entirely out of this earth.

These gates were so heavy that mere hinges could ardly support them. Therefore, air spaces were left at ıe bottom, and when the locks were filled with water, ıe gates, in a measure, floated. That was only one of a undred wonders in the construction and mechanism of ıose great gates.



A wise man who visited the Canal Zone when th gates were nearing completion was asked what h thought they might fitly be called. He stood like a tin elf in the massive concrete trough of the lock, watchin the gate slowly swing open, then said: "I think they ar the gates to a new world—a new life for all men."

Hodges needs no other monument.

* * *

On the other hand, it was Sydney B. Williamson, th old friend of Goethals who had worked with him on th Tennessee River, who built two of the important locks o

ıe Pacific side of the canal—not the gates, but the great ɔncrete troughs from which the gates hang.

Williamson became almost a legend in that world ʻhere men made the wonders of antiquity fade into ıute silence. It was said that no one could pour concrete ɔ fast as Williamson could; it was said that he let the ɔncrete flow where it would, and mighty locks came out : the disorder. Of course, he did no such haphazard ıing. Every inch of poured concrete was measured and anned in advance.

Panama is a monument to what man can do in a world : peace. Panama is a place where men became giants—ants to build, not to destroy. Close your eyes and try to e a lock, the gleaming whiteness of millions of pounds : poured concrete. Millions of pounds, yes—but what is .e measure of a lock? What does it mean if you say at in each lock there were as many cubic yards of ɔured concrete as the great Pyramid has cubic yards of ɔne?

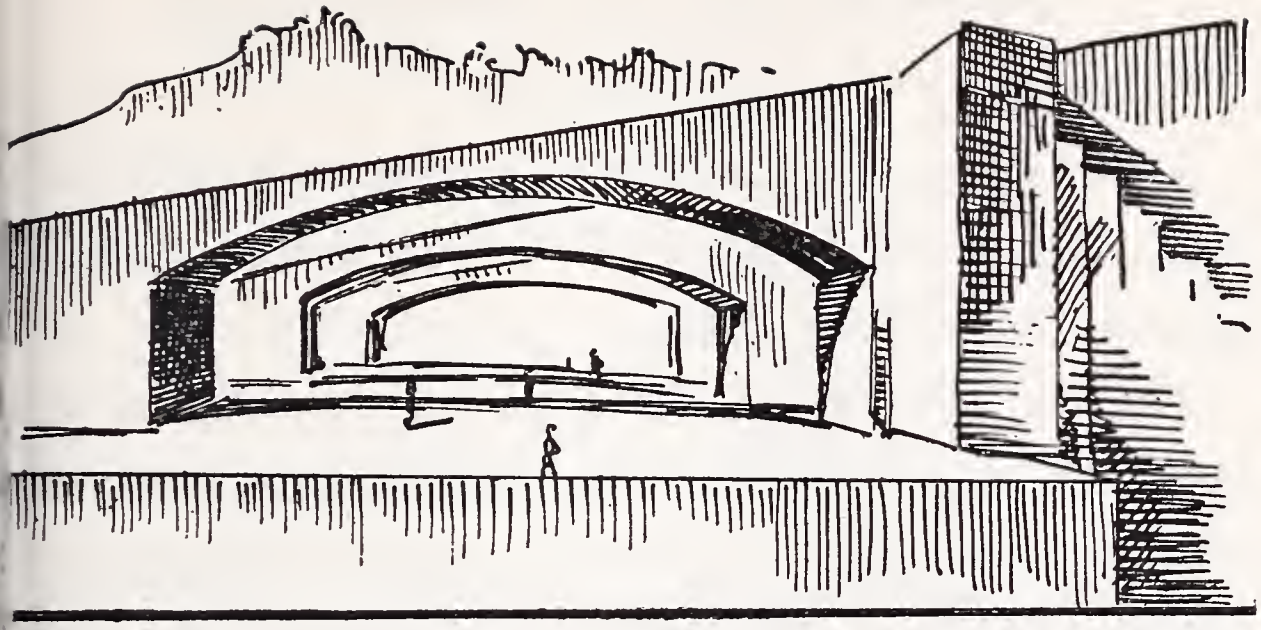
Even the engineers, sober men who lived in a world of ırd facts and figures, were awed by what they were ɔing. Here was a measure of man! Dreams are on such ; scale, but here was solid reality. Steel rails from the old ıilroad were used as re-enforcing rods; boulders as large houses were dumped into the concrete soup for bulk. And it rose, gleaming, shining white walls a thousand

feet long, ninety feet high, eighty feet thick at the base

Today we are discovering something called the beauty of *functionalism*. This means that if anything is built perfectly to serve the purpose for which it is intended, that thing will be beautiful. Out of the practical plans of the canal engineers rose such beauty as to awe men into silence and wonder. In one case, where reinforcements were needed for one of the walls, a way was thought out by which a good deal of concrete could be saved. Acting on these mechanical principles and on nothing else the engineers built the reinforcements. What was their surprise when a party of artists decided that those reinforcements were the most perfect flying buttresses they had ever seen!

And there was, too, an intangible beauty—of men well and strong, able to do their difficult work effectively because of the skill and knowledge and determination of one man—Dr. Gorgas. Into the great peacetime battle against the dread malaria, Gorgas had put all his own strength. And he had won that battle. The Canal Zone was now a wholesome place in which to live and to work.

There was enough of beauty, and it rose like a miracle out of the confusion, the shouting, the sweat and toil and exhaustion. Songs could be sung and stories made of the engineers who labored there: Williamson, Sibert, Gaillard—dozens more who could be named and thousands who are nameless. But they all left their monument—a



ıonument toward man in his search for light and truth
ıd civilization.

* * *

Over all, Goethals, co-ordinating, synchronizing, oiling
.e machine, keeping it running, being everywhere at
ıce, building up in himself a reasonable picture of the
hole sprawling effort.

The "Yellow Peril" dashed everywhere, and every-
here was not enough. It was the colonel here and the
lonel there. A problem was solved, but hardly had it
nished than another problem arose.

A lock was being built, and suddenly the foundations
ere found to be slipping over a mess of gluey clay. The
lonel was needed. The lock had to be relocated, work
mmenced again.

At the Cut, for instance. The guts of a mountain were
ing dug away, yet again and again a slide would wipe
t hours of weary labor.

"Keep at it," the colonel said.

But as the years passed, work progressed. The cuts be came deeper and deeper, and men decided they had th grumpy old Isthmus licked.

Then, in 1913, when it seemed that their patient labo was to be rewarded, when the canal was almost finishe and ready for traffic, a great slide came at Cucaracha, th biggest slide in all the history of the canal.

This was more than flesh and blood could stand. Th men dropped their picks and shovels and sank wearil to the ground. The engineers wept tears of bitter mortif cation and cursed soundly. They had taken all the could; they were ready to give up. Colonel Gaillard, i charge of the work, was quite frantic. He sent a desperat message to Goethals to come at once.

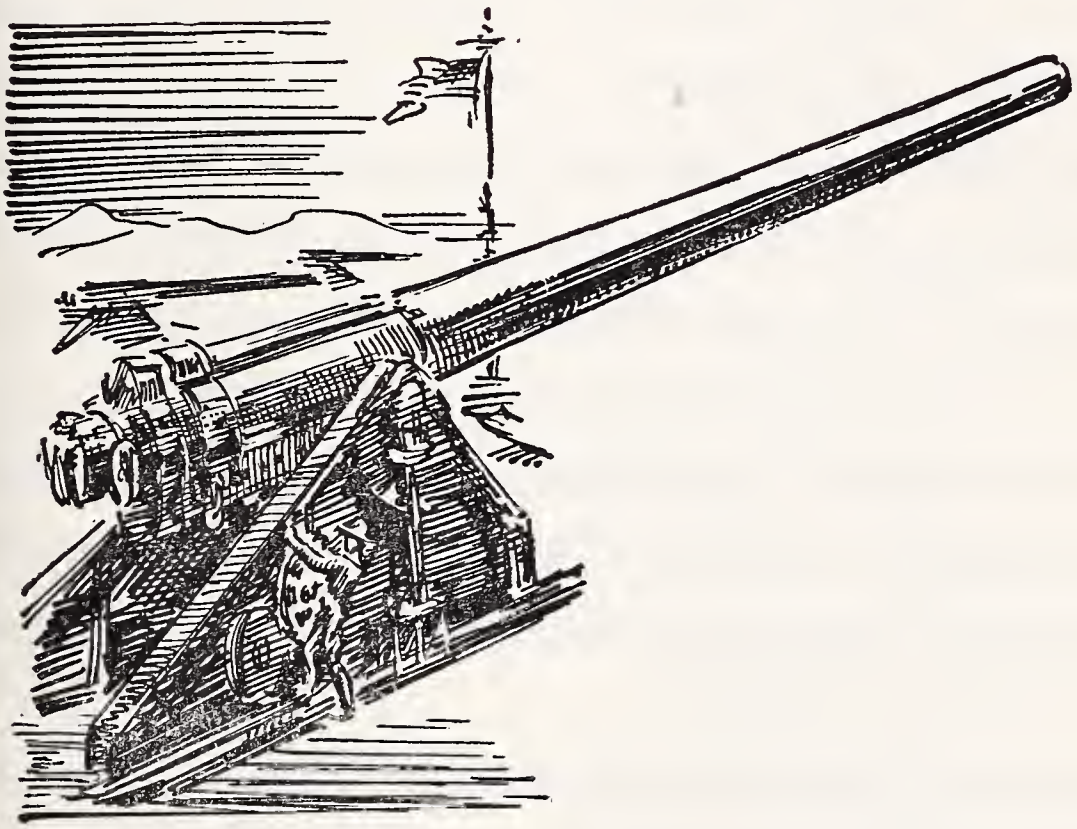
Goethals arrived promptly, a big, slow-moving figu in white. He looked at the slide, apparently undisturbe

"What are we going to do now?" Gaillard pleaded.

Goethals shrugged his shoulders and said, "Dig it ou again!"

CHAPTER NINE

"A Man Stood Up in Panama"



SUPPOSE GOETHALS HAD NO WORRY AT ALL ABOUT BUILDing the canal, about throwing the dam from hill to hill at Gatun, about building the twelve locks and breaking the backbone of the Continental Divide. Suppose all that had been taken out of the picture.

With all that taken away, what was left? Remember,

he was in charge of the Canal Zone. Here are a few o his duties, aside from building the canal.

At the height of the building activity, there were som sixty-five thousand men and women and children in th Zone. They had to be fed, clothed. They had to hav medical care and health care. They had to have polic protection.

The force was fluid. Men left their jobs and new me had to be hired. Men holding one job desired to be trans ferred to another. Men were injured and new men ha to be put in their places.

Linked in with that was railroading. The sixty-fiv thousand people lived by the railroad, and the canal wa built with a railroad. There were no motorcars in th Zone on that job, and no roads over which automobile could run. Everything depended upon the railroad: hau ing of supplies, transfer of dirt taken out of excavation shipment of concrete in fluid state, shipment of men– so on and on endlessly.

But the railroad moved and shifted, died out here an renewed itself there. Each new piece of work demande a spur line. Rails were torn up, flung onto cars, and pu down somewhere else. Lines shot out, handled traff enough to drive their ties deep into the soft earth, an then rusted from disuse.

Or docks; in the years of the canal work, the Isthmu strove to make amends for all the centuries it had bee

sleep. Ships rode into its ports in an endless stream. Yet vhen Goethals came to the Isthmus such shipping was till a dream. Then Balboa was the Pacific terminus of he canal. Goethals went to Balboa with the thought of port in mind. He found a miserable village crouching t the edge of mud flats. When the tide went out, the lefeated hulks of the French dredging fleet were exposed, ying half buried in the mud.

"It's a mess," Goethals said, "but we'll make a port f it."

The French dredges were examined carefully, and hose in any sort of condition were raised and repaired nd set to work deepening the channel. Along with them everal new American dredges were put into action. A ig concrete seawall was constructed, and suction dredges ucked up the mud from outside this wall and squirted inside. This served a twofold purpose, deepening the arbor outside and making dry land inside upon which city might be built.

Meanwhile, endless cars of dirt were dragged from the ut, dirt to build breakwaters and dirt to turn swamp- nd into dry and healthy building plots. In such a way ne hundred acres of land were reclaimed, and on this nd Goethals built a model port and city. He built con- ete docks and he built great warehouses. He constructed drydock large enough to accommodate any ship that ight pass through the canal, and to that he added ma-

chine shops and forges, a coal depot, fuel-oil tanks, stores, laundries, cold-storage plants, even bits of grassy park. And as if that were not enough, on the heights above Goethals built a beautiful city, at the time perhaps the most modern little town in the world.

So that the ships could come and go, here was man taking the goods of the world and building what his heart desired.

* * *

Men had forgotten that far-off day when he first came to the Isthmus. Then he was the *Army,* and the thousands of workers snarled under their breath at what the world was coming to. Then it had meant shoulder straps and gold braid and drilling and discipline, and everywhere Goethals went he met black faces and stares of hatred.

All this was gone now. The men of the canal, one and all, called him the colonel, but it was not a *colonel* whom they connected with any army. It was the tall, white-haired ambling figure in civilian whites, going everywhere, poking into everything, having just the right word of praise and the right word of censure.

Edgar Young tells the following story about the colonel:

"I remember once when a train of empties, coming down into Culebra Cut at Tower R, bumped into

alled train. There was an investigation. The engineer
id he had applied the emergency brake and then re-
ersed. The colonel grinned and asked, shrewdly, 'Why
id you reverse after big-holing her?' That question
nned two errors on the engineer. The occasion de-
anded a heavy application of air, sand under the drivers,
nd the big-hole, or emergency, as she slackened. He
nt the offending 'hogger' back to work with a wave of
e hand. We got to know that the best way out of
ouble was to own up when we were at fault."

He was a fair boss, and he knew all the angles of the
b, inside and outside. There is nothing that can make
od workmen so furious as unjust or ignorant criticism,
nd that was one pit into which Goethals avoided falling.

His men grew to have a deep and abiding affection for
m, and it never displayed itself better than that time in
ecember 1909 when news came to the canal men of his
omotion from lieutenant colonel to colonel. Goethals
as scheduled to escort a party of congressmen to the
ut on a special train. Now, congressmen were the bane
his existence. They flocked down to the Isthmus on
ery slightest provocation, poking all over the canal
orks like fussy old maids. The colonel had to handle
em with kid gloves. They asked innumerable silly ques-
ns and they felt it their duty to criticize every aspect
the work.

This time Goethals was on edge. He wanted to get the

congressmen to the Cut, show them the work, and b rid of them, so he could get back on the job. Yet th train was unaccountably delayed. Goethals' tempe frayed thinner and thinner.

The train reached the Cut just as the eleven-o'cloc whistle blew. Immediately after, dynamite charges bega to go off. There was nothing unusual about that; th safe way was to fire the dynamite charges after the me knocked off work. But there was a certain rhythm t these charges, a certain regularity in their firing tha made Goethals knit his brows uneasily. Then he remem bered, counted, and broke out smiling. They were firin off a military salute in his honor. It was their own per sonal tribute to him, one that he would understand although it left the congressmen puzzled and indignant

Perhaps he reflected, then and there, that his best piec of work at the Isthmus was the manner in which h gained the liking and respect of the men.

* * *

One fact Goethals never forgot was that the canal mus be fortified. Of course, he couldn't foresee the day whe America would be desperately building a mighty two ocean navy in a race against time and the spreadin octopus of fascism; nor could he know that at such a tim the future of the world might hinge upon the single fac of the Panama Canal. But he did know that the cana

ould, upon completion, become the single most im-
ortant extraterritorial fact in the defense of the United
tates.

With that in mind, he worked mightily to have money
ppropriated for the defense of the canal, and when the
ioney was finally forthcoming, he went quickly ahead
ith the defense work.

The defenses put into effect at the time made no con-
deration for air attack, for flight was still in a very
rimitive stage. Nevertheless, it was foreseen by some
iat air power would play a very considerable part in
iture wars. However, at the time, no air defense was
nown.

The first and basic defense was to mine the coast,
iaking the approach of any enemy force as difficult as
ossible. Great fourteen- and sixteen-inch rifles were in-
alled in such a way as to cover any possible approach
either entrance of the canal.

It was realized that for all the massiveness of the locks
id gates, they were still the most vulnerable part of the
inal. A battleship, coming within range, could put locks
it of commission with a very few well-placed shells;
ierefore the purpose, in main, of the defenses would be
keep enemy warships away from the canal entrances.

There is a saying to the effect that an old fort can
nk a very new battleship, while the newest battleship
innot sink a very old fort. With that in mind, Goethals

planned the fortifications in a way to make it a virtua impossibility for any ship to approach the canal entrances

In one matter he was bitterly disappointed; news o the locations for the gun emplacements, which he hope to keep secret, leaked out. Anyone could read where th guns were set, how they were trained, and just how fa they could shoot. For all that he made the fortification as foolproof as was possible at the time.

* * *

It was said of Goethals that no more benevolent despo ever ruled a piece of land. To a degree that was true. H was a despot, for during the time of canal construction h ruled the Canal Zone as completely as is possible for man to rule.

The "benevolent" part is not quite so accurate. Th colonel was just and earnest and straightforward, but h wanted the job done and he let nothing stand in the wa of his doing it. Perhaps the best way to see the man wh made the canal is to follow him through a typical day' work.

It is six o'clock, and the colonel is up. So is the sun. A the Isthmus the sun rises at six o'clock in the mornin every day of the year. The colonel makes an exception o Sundays.

By half-past six, he's dressed and ready for breakfast He starts off with a small native orange, peeled and stuck

n a fork, eaten as they eat mangoes in the tropics. Then Benoit, the butler, brings the rest of the breakfast and a ot drink. The colonel eats his meal and ruffles through few papers and letters at the same time.

Then he's out of the house and off to work. A short, risk walk down the hill to the station. The first train is northbound one, and it pulls into the Culebra Station t 7:10. The second train, a southbound job, is due at :19. Sometimes the colonel ignores both trains and limbs into his private "Yellow Peril." But today he's impatient, and as the 7:19 pulls in, he swings aboard.

The engineer grins out of the cab window and cups is hand to his chin whenever they pass anyone. This esture means that the boss is on board, going back to the ays when the boss was an elderly gentleman with a long eard.

More than likely the car into which the colonel steps vill have a generous population of engineers, foremen, nd operators. The colonel nods, grins, says his hellos, nd then singles out someone with whom to discuss a iece of the work. It may be a small thing, like the laying f a section of rail in the Cut, but the man will wonder ow the colonel knows every detail of the work so explicitly.

The train slows down, and the colonel, seeing something that interests him, hops off without any formality. He scrambles down the side of the Cut, and his white

trousers get their morning baptism. He stops at a poin where a large slide has come down the day before.

"More comes down than we take out," the foreman i charge says.

"Keep taking it out," the colonel says. "Either we lick the slides or they lick us—and we've got a long way to g before they finish us off."

Then he is away, scrambling over the freshly ex cavated dirt. He never has to take exercise as exercise there's enough of that clambering up and down the side of the cuts.

By noon the "Yellow Peril" will be chugging up an down the track, looking for him. He climbs aboard an shuttles back to the house for lunch, but all the wa keeping a weather eye peeled for every detail of th work. Benoit, the butler, is waiting for him. Benoit is a institution at the canal, having come with the Frenchme in the days of the great fiasco. Since that time he ha worked for four French chief engineers and thre Americans.

When asked where he was going or what he would d after the canal was built, Benoit would reply: "I am goin to Jerusalem."

No one is certain whether Benoit is merely eccentri or somewhat insane. His appearance is matched in fierce ness only by that of his macaw, Garibaldi, who had th run of the household. But Benoit can prepare Goethals

neals as no one else can, and for the time being he is king of the Zone.

After lunch the colonel lies down for half an hour, after which it is his usual practice to work in the office until five-thirty.

But today something interrupts his office work. A new engineer came to the Zone a few weeks past, bringing his family with him. While his house was being built, he took up quarters at the hotel, with Goethals' assurances that the house would be completed by October. But here it is with October a week away, and all the engineer sees of his house is part of the foundation and a few lazy, slow-moving workmen.

He comes to Goethals and complains: "But you said the house would be ready for October."

"I did," Goethals nods.

After lunch they go out and walk over to the house. The contractor, who has been working very leisurely, makes a great stir of activity as he sees Goethals approach.

"What can I do for you, Colonel?" he asks.

"You can do nothing for me, but you can build the house for this gentleman."

"I'm doing the best I can."

"You'll finish this house for October!"

"But how can I?" the contractor wails. "I've been working as hard as I could, and you see how far I've gotten."

"When I told you to build this house," Goethals says quietly, "I didn't ask you to do the best you could. I told you to build it for October."

The house was built for October!

Back in his office, Goethals digs into the mass of afternoon detail. This is the part of his job he likes least, the part that is hard, unremitting toil.

Somehow the work gets done, and the colonel has time for a bath and a change of clothes before dinner. Dinner is at seven, and likely as not there are guests. The colonel is charming, gracious, and manages quickly to put everyone at ease. But no sooner is dinner over than he excuses himself and returns to his office.

"Is the man human?" those about him ask.

He's human enough, but he possesses one quality in rare abundance—the ability to work.

* * *

But on Sundays there was a change of schedule. Sunday mornings a scene took place that was strangely reminiscent of the caliphs of Bagdad a thousand years ago.

For Sunday morning, at eight o'clock, in his private office at Culebra, the colonel held court. Not a court with a judge and jury; not, indeed, such a court as there was anywhere in all North or South America, but a court of justice nevertheless.

There anyone could come who had a complaint—man or woman, black or white, young or old, each was free to come with his grievances and ask justice of the colonel. His was the last word, and when he rendered a decision they could appeal only to the President of the United States.

One wonders whether such a scene will exist anywhere again, a single man holding complete and tolerant sway over an army of workers, engineers, laborers, artisans, doctors, lawyers, nurses, storekeepers, policemen, firemen, soldiers.

Let us sit with the colonel for one Sunday morning while, wearing his usual white, he holds court. His private office is the trial room, and his flat-topped desk is the judge's bench.

Outside, in the waiting room, those who seek justice or comfort begin to arrive. They seat themselves on benches, and the rule is, first come, first served. Color or nationality has no place here, and for that reason most of them come very early. Black and white and brown and yellow, they sit on the edge of the benches, clasping and unclasping their hands nervously.

One of the colonel's assistants passes up and down the aisles between the benches, asking, "Name and check number! Let's have it—name and check number!"

Then he goes to the files and hunts up the complainant's service record, which will be laid on the colonel's desk a few minutes before that particular case begins.

The first case is not a strictly legal one. A young Virginian surveyor and his wife have had a violent quarrel with each other, and they have separated, not a very easy nor a very comfortable thing for a couple to do at the Canal Zone. The young man is making twenty-two hundred dollars a year, and up to a week ago they were living very comfortably.

The colonel hides a smile and glances through the husband's service record. Then he says, "Kenny, you have a pretty good record here."

"Yes sir," the surveyor answers eagerly. "This is my first chance. I wanted to make good."

"You figure that if you make good on your first big job the rest will take care of themselves?"

"Something like that, sir."

Goethals studies the record and speaks without looking up. "Kenny, a week or so ago there was something of a disagreement between you and Black on laying that piece of spur up your way. It seems to me that you were right, but you gave in. Why?"

"Well, sir," Kenny answers uneasily, "I thought I was right—I guess I knew it. But the job was more important, and I wanted to keep the job going. The job was more important than my getting the best of Black, so I gave in. Perhaps I was wrong—"

"Perhaps," Goethals says, and then turns to the young surveyor's wife. "Marriage is a pretty big job," he continues. "For a lot of people, it's their first big job, their most important one."

The young man and woman look at each other. In a few minutes more of quiet talk Goethals has straightened things out. The couple goes off happily, and the next case is called in.

This time it's an Italian laborer. He can speak only a few words of English, so the colonel calls in an interpreter. The Italian is a man past middle age and he's in a work gang with young men. He can't stand up to their pace, and therefore comes in for the biggest share of the

foreman's abuse. He's almost in tears. He has to keep his job at the canal, for he hopes someday to enter America, become a citizen, and bring his family over from Italy. But sometimes he feels it would almost be better to die than to work under that foreman and be singled out for scorn and abuse.

The colonel hears his story patiently, and then calls for the foreman's record. To a certain extent the foreman's record bears out the Italian's complaints. The foreman is overbearing, his section has frequent changes of personnel. Their work record is bad, and in volume they are behind the average of the sections near them.

"I want that foreman brought in here," the colonel tells his assistant. "As for this fellow, take him out of the gang and make him a helper on train twenty-two at the same pay. He's too old for pick-and-shovel work."

When the Italian is told the colonel's decision, he is almost tearful in his thanks. He is ushered out, and the next case enters, a tall, coal-black West Indian and his wife. They are both shaking with fear and embarrassment, and little beads of sweat roll down the man's high black forehead. They keep their eyes fixed on the ground, and they hold hands anxiously.

Never in their wildest dreams would they have believed such a thing possible. For them the big white boss was a far-off, unapproachable object. Nothing but the

most acute pain and misery could have brought them into his sanctum. Yet for all that, here they are, face to face with the "cunel."

Goethals nods and smiles and does his best to put them at their ease. The West Indian's name is Frank. Goethals says, "All right, Frank, suppose you tell me the whole story."

Frank tries to speak, swallows his words, gulps, and stares at Goethals blankly. The sweat rolls faster and faster. Under his cotton shirt the great bulging muscles tense and quiver. In the Culebra Cut, those bulging muscles make the dirt fly like chaff from wheat, but here they are quite useless. The mighty strength that can outwork any four white men is abashed and silent.

Goethals knows how to put a man at his ease. "That last slide," he says, "was a mean one, eh, Frank?"

"Shore was," the Negro nods.

"Seems the more we dig out the more piles in."

The West Indian grins. This is work talk, and he begins to realize that when all is said and done they are both on the same job. Slowly and patiently, Goethals draws out his and his wife's story. It is the old, old complaint of discrimination, petty injustice, cheap extortion. Their living quarters are hot and airless and tiny and foul, and the woman is expecting a baby. But the only way they can obtain cleaner and larger quarters is to pay

a certain person a very large sum—so large a sum that they would have to borrow it and then work for a whole year to pay it back.

They don't mean to complain and they don't mean to carry stories about white folks, but this is their first baby, and they are afraid that after it comes it will die if they keep it in the place where they are living now.

As the colonel listens to the slow, broken speech of the West Indian, the smile leaves his face. It becomes hard and a look appears that bodes ill for someone. When the West Indian has finished, the colonel says evenly, "Repeat the name of that man who wants you to pay him the money."

Frank repeats the name and asks anxiously, "Do I gotta pay 'im, Cunel?"

"Frank, if you pay that man one cent, you'll never again work on this job or any other! Do you understand?"

The Negro nods. His wife has been regarding Goethals with an expression of complete adoration.

"Meanwhile," the colonel says gruffly, "get your things together and get ready to move into new quarters. Seems I have a place in mind in that row of three-room flats we put up over on the ridge."

It is hard for him to acknowledge thanks, and he only nods as the two Negroes stammer out their gratefulness.

Four men come in now. They are a committee of com-

plaint against the Sanitary Department in their area. A certain section of swamp grass that should have been burned over has been neglected, and they complain that mosquitoes are swarming all over the place. There have been two cases of malaria.

Goethals calls in the representative of the Sanitary Department and he tells his side of the story. Accusations and counteraccusations are flung back and forth. The case becomes more and more involved.

Goethals imposes silence and then starts to untangle the threads. It is a long and wearisome business. He frequently runs his hand through his curly white hair. Finally he renders his decision and the next case enters. A boy from San Francisco is homesick and wants to get out of the Canal Zone. He is only seventeen, and he thought that coming to the Isthmus to work on the canal would be a grand adventure.

But now he has only one thought—to get back to his folks in San Francisco. Three times he tried to stow away on a boat for America, and each time he was discovered before the boat left Balboa. He quit his job, has no money, and in the hot, tropical climate of the Isthmus he is rapidly going to pieces.

He stands in front of Goethals, trembling a little, seemingly on the point of tears.

"You want to go home?" Goethals asks him kindly.

"Yes sir."

"Have you a home in San Francisco?"

"Yes sir—my mother and father are there."

"And they won't send you money for passage?"

"They're very poor, sir."

"I see. And you were trying to stow away. You're old enough to know that a man can't ride on a boat without a ticket, and you're old enough to know that you were breaking the law."

"Yes sir."

"And if I put you in jail, you wouldn't like that. It's not nice for a boy of your age to go to jail."

"No sir."

"Why didn't you keep your job until you had saved up enough money for passage?"

"I wanted to go home so much, sir. It would have taken months for me to save money on the job."

"Not if you cut out card playing," Goethals says sternly, looking at the boy's record. "Now see here, I don't think you deserve a chance, but I'm going to give you one—not for you, but for your mother and father. I'm going to put you back on the job. No cards, no dances, no drinks. You stay on the job for a month and make good, and if you still want to go home then, I'll find you a berth as a cabin boy."

The boy nods his head and stammers out his thanks, trying all the while to keep back the tears.

So it goes, all morning, case after case, men and women

with their endless procession of complaints. But somehow the colonel keeps his smile, and somehow his patience does not exhaust itself. To be sure, the wrinkles on the round face etch deeper. But neither his understanding nor his sympathy depart; his judgment is sure and certain and balanced.

There is the case of old Jim Ferdy. Jim was one of the first of the steam-shovel men, a man so good that the shovel was almost a part of his being. But now he was sixty-seven, and they have taken him off the shovel, given his place to a younger man, and set him to driving an electric donkey engine. Jim's heart is near broken, and he comes to the colonel with a plea to be put back on his old job. Jim feels that he can take some liberties with the colonel, because the colonel has been calling him by name and talking job with him for years now.

"I'm as good as any young squirt of thirty," Jim says earnestly.

"Better," the colonel agrees.

"Shovels—man, I was running shovels when they were teething. What do they know about shovels? A shovel's a stranger to them."

"A shovel's no stranger to you, Jim," the colonel agrees.

"On a donkey engine," Jim mutters.

"Look, Jim," the colonel says earnestly, "we're both of us getting no younger. The hardest thing a man has to

learn is to step down and let a youngster into his shoes I'm going to have to learn that someday, and it's going to be mighty bitter medicine for me to take. But we all take it—somehow."

"I suppose so," Jim mutters, staring at the floor.

The colonel grins and says, "One thing we can be sure about—no young squirt is going to take the dirt out of Culebra that Jim Ferdy has. How about shaking hands on that?"

They shake hands, and the next case is called. Another Sunday passes. Goethals is tired and his white curls have lost all sense of orderliness. But he's still smiling.

* * *

In its heyday, in its roaring years of life when thousands of men worked in that tiny strip of land called the Zone, the canal was the manufacturer of legends in plenty.

Where on the earth's surface had so much dirt been dug?

Where on the earth's surface had so many men sweated and strained so long in one mighty effort to build?

Where was there such a man as Lanny Forks, who started to dig at Culebra and never stopped digging until he poked his head out into the warm China sun?

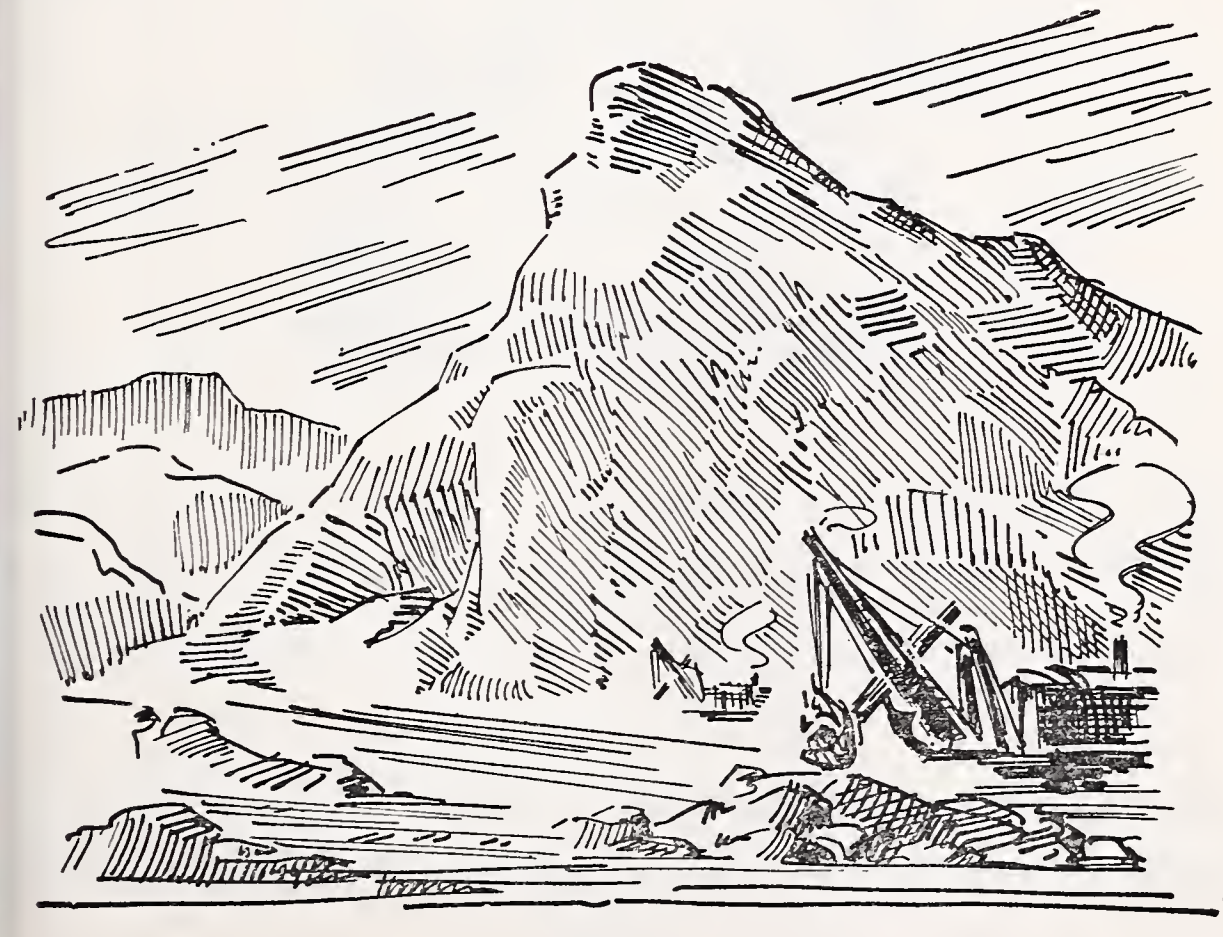
Or such a man as Fallin Gale, who swore not to let a

team shovel get the better of him, and broke his heart but dug that shovel all to pieces?

Or that mysterious figure in the dress of an old Spanish Don who perched in ghostly shape on top of the Culebra Cut and sent the earth toppling down to discourage the canal makers?

Or that nameless West Indian of mighty stature who, when he was all alone, saw a slide coming and held it back with his own strength—and even pushed it some distance up the side of the slope?

But for each of these there are ten legends of Goethals. Even today old canal men never tire of telling their stories about the "colonel." He was that to them, the calm, masterly figure in white duck, who "knew his way around."



On they struggled, ever onward,
  Blasting stone, and earth and men;
Filling rivers with razed mountains;
  Filling graves with parts of men.
Blood and bone are mixed with concrete,
  Sweat of brown and grime of toil
Mark the rough-neck as he swelters,
  Weary 'mid the grease and oil.
Weary flesh, nor fever's terrors
  Halt them as they onward go.
Forward! Forward! Ever forward!
  Is the only cry they know.

—*John Hall*

CHAPTER TEN

"And the Mountains Stood Aside"

HE WORK WAS DONE; THE LABORS OF HERCULES WERE ver. The Army leaned on its tools and tried to realize ıe first moment of peace the Isthmus had known in ten ears.

A strange silence lay over the narrow neck of land that eld two continents together. The shrill hooting of steam

whistles had stilled itself; the rumbling of a hundred thousand wheels had stopped. The sound of dirt and rock being moved and piled and shuffled had ceased. People cocked their ears for blasts that never came. That was the strangest thing of all, since for years and years the sound of blasting had echoed back and forth over the Isthmus.

That was done with now. It was much as if a great and terrible war had come to an end—not in victory, but in an armistice. For the army of canal workers seemed unable to believe that they had truly finished the task. It had been so big, so crowded, so disjointed that now they hardly knew that they were done. Their instinct was to go on working. Surely there was still work for them to do. Surely it could not be all over. Surely there was concrete to pour, rock to blast, dirt to dig, mountains to move, rivers to dam up, throw back and change in their eternal course.

It was done—all done.

Of course, there was still a great part of the Cucaracha Slide to be excavated from Culebra, but that was a matter of using dredges after the canal had opened.

Otherwise, it was done.

The roustabouts were in clothes that had no mark of dirt and mud and powder; the engineers were in their shiny best; the operators were spic-and-span and awkward and puzzled; the big black West Indians were

hined and spruced, their bulging muscles squeezed into ight jackets and pants.

Because it was over.

The little groups that gathered to stare at the locks, oon to be flooded with water, were somewhat puzzled, omewhat bewildered. What were these mighty white nountains of concrete? Had this come from their own ands? Had they built this awe-inspiring power and eauty?

They looked at piles of iron rails that had once been pur lines into the Cut. Already the rails were rusting, ut it seemed only yesterday that they had laid them own with their own hands and driven spikes into the ies.

They looked at the steam shovels, prehistoric monsters vhich had eaten dirt for ten long years. Was their life lone with, too? Some men idly flicked clods of dirt off he big shovels. The monsters were silenced.

Hundreds and hundreds of dump cars lay along the idings. The Isthmus had no sympathy for neglected netal. Already the metal wheels were rusting, the vooden sides rotting. How much sweat and toil and lood had been poured into those dump cars! And dirt! And rock! Millions of cubic yards meant nothing now. A million cubic yards in one slide—and all that was a nemory.

Hammers, wrenches, sledges, shovels, picks, crowbars,

drills, tools in thousands and tens of thousands. An arm had laid down its arms, and already men were findin the effort difficult to recall.

The job was done.

* * *

The Isthmus had been beaten. Its long and bloody his tory had come to an end, and a restless, toiling, seeking hoping humanity had found their westward passag at last.

Columbus had sailed there, driving his ship against the rocky side of the continent in vain, hoping for a retur home around the world. Balboa had plodded through the jungle to top a hill and be the first white man to lay eye upon the Pacific. The Spanish dons had taken their full toll in blood and silver and gold. The English pirates had further stained the green slopes of Panama. But never a man took from the Isthmus without the Isthmus having full measure in return.

The Forty-niners went to find gold and California, and the Isthmus was only a hindrance under their feet. They shook it off. Then a railroad was built, and the saying went that for every tie a man laid down his life. Malaria hung there like a festering sore, and the saying went that a man gave away half his life when he went down to Panama.

The French took money from thousands of little men,

ınd the reward of their money rotted in the swamps of he Isthmus.

* * *

When the United States started their canal, the war vith Spain had just been brought to a victorious if not a ery noble conclusion. Now all that seemed in a fantastic ast. McKinley had been President; he had been assassi- ated, and Roosevelt stepped into the White House. Two erms of Roosevelt, Taft, and now Woodrow Wilson was resident of the United States. In Europe were the rooding embers of the greatest and most terrible war in istory up to that time, the First World War.

The airplane had come while men mucked and cratched at the canal. From an oddity the automobile ad become the accepted mode of travel, completely re- lacing the horse and buggy. Gas, which had once been ich a miracle, was fast becoming obsolete for lighting, nd the nation blazed with electric lamps. Malaria had een beaten, and so had yellow fever.

And the backbone of a continent had been sliced in alf.

* * *

The date was to be September 26, 1913. Then the nal would be opened, with water turned into the Gatun ocks.

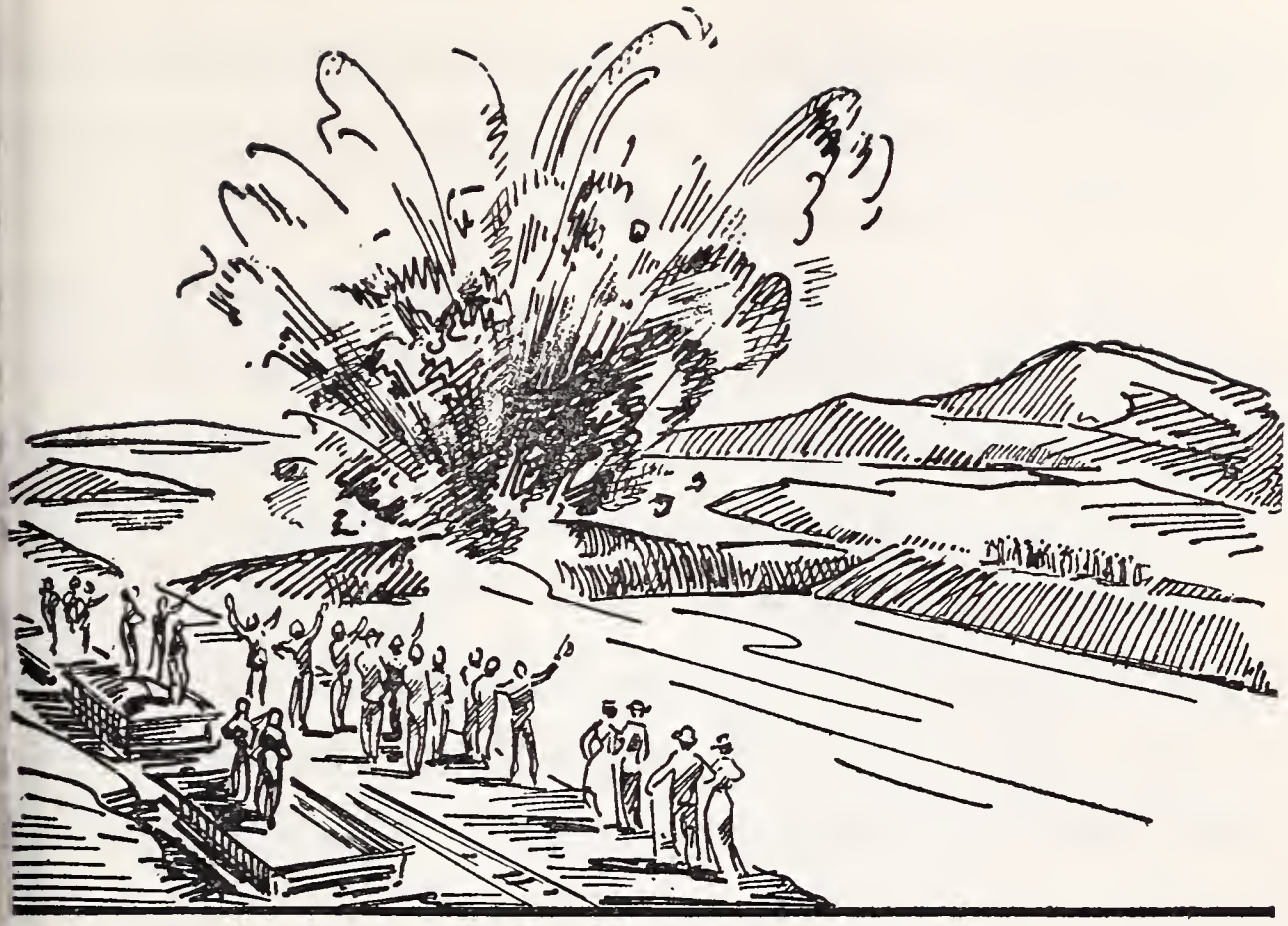
Everyone, from Goethals down to the last pick-and ax man, was both worried and excited. What woul happen? It is true they had built a canal according to pla and the plans were good ones, but plans were one thin and actuality was another. Now the canal was a huge dr ditch, and they knew every inch of it, the white bulk c the locks, the freshly painted steel gates, the raw di scars of the cuts. They knew every scratch, every lump every ditch.

But the canal with water in it would be somethin else. Their labor would be hidden and flooded, and a that would count would be proofs.

Special trains were to be run for the visiting official but the canal men, the huskies and roustabouts and en gineers flocked to the concrete lock walls. This was thei job, and they were going to be on hand. They brough their wives and their children with them, and they cam early.

Finally the moment arrived. The lake sluices wer opened. For a long moment nothing happened, nothin at all, and everyone, including the colonel, appeared t be holding his breath.

Then water gushed, the first water. It spurted from th round openings in the bottom of the locks, brown an dirty, but water nevertheless, to join two oceans and tw halves of the world. The water rose higher and highe



nd now the watchers noticed that the water was full of
undreds and hundreds of frogs, washed down from the
ake and swimming around in ruffled bewilderment.

It eased the strain, and the men began to grin and
ugh. Things were going beautifully. Even the frogs had
oined in the celebration. And the water continued to
se, inch by inch, foot by foot, until at last it was on a
vel with the water of the sea-level canal on the other
de of the gates.

Now the great moment had arrived. The gates would
e opened, and the water of the Atlantic Ocean would
virl into the first lock of the Panama Canal.

Colonel Harry F. Hodges, watch in hand, stood on one
the walls. The gates were his, his child and his pride

and joy. He knew all the secrets of their huge mechanism, and he was possessed of all the doubts a man can have concerning his own handiwork.

Hodges gave a signal, and for the first time in history the Gatun gates parted in sea water. Sea gates and guard gates, the whole mighty mass parted and swung through the swirling water to their niches in the walls.

Hodges was grinning like a boy, while people crowded around to congratulate him. He was nodding happily. The time was one minute and forty-eight seconds for the complete operation—a full twelve seconds less than the time stipulated in the contract. In water, the giant gates worked as efficiently and as quickly as they had during the dry tests, four months before.

Colonel Hodges couldn't contain himself. He kept saying, "Perfectly, perfectly! Everything's working just as we planned."

Men came running to report on the bull wheels, the stem valves, the outlets. It was all going as smoothly as if the lock had been in operation for ten years.

Edward Schildhaur was sharing the colonel's joy. He was the electrical and mechanical engineer for the commission, and it was he who had invented the bull wheel, a giant horizontal disk placed inside the lock wall, with a pivoted arm attached. When the bull wheel turned, the mighty gate opened as easily as household door.

The lock was ready for its first ship, the tug *Gatun*

Loaded with proud engineers and officials, the *Gatun* steamed into the lock, hooting and blowing her whistle. Colonel Sibert stood on the deck, his face glowing, bowing left and right.

In a special way, Colonel W. C. Gorgas looked upon the completed structures. None knew better than he the silent and constant battle against disease that had so gallantly and successfully been waged. Modest and retiring, he praised the greatness of Goethals' engineering feats. But those feats would not have been possible without Gorgas' work, a fact more and more widely recognized in all the years since.

But for one man of them all it was less a moment of triumph than of worry and fretful anxiety. Six years of Goethals' life had gone into the canal, the best six years, the hardest six years. Like a mother he had watched over every bit of it, and like a father he had dispensed justice to those who labored upon it.

For only one purpose, to build a canal, he had ruled like a despot over this piece of United States territory. If men's lives are lived for one single moment, then this was Goethals' moment, a moment of dread and completion, in one.

He didn't want the spotlight, and for that reason he had not taken a place upon the triumphal tug; but for him the tug *Gatun* was one of the most important features of the day. At last a ship was being warped through

the canal, and at last the big ditch was being put to its test.

At the same time he was receiving reports on how the lock was operating, on the bull wheels, on the sluices. It was a dread moment, but it was a splendid one.

* * *

As yet the whole canal had not been flooded. You remember that by damming the Chagres River a large lake had been created in the central part of Panama. The surface of this lake was some eighty-five feet above sea level, and it was intended to form a water bridge between the locks.

Now the waters of the lake had been held back from the Culebra Cut by a temporary dam. It was only by blowing up this dam that the Cut could be flooded and the whole of the canal filled with water. Gamboa Dike, as this dam was called, had already been mined with eight tons of dynamite. Wire connections were made with Washington. Touching a button was all that was needed.

On October 10, President Wilson, at the White House in Washington, made the connection that exploded the charge of dynamite, and the waters of Gatun Lake flowed through the broken back of the Continental Divide.

The oceans had been joined.

* * *

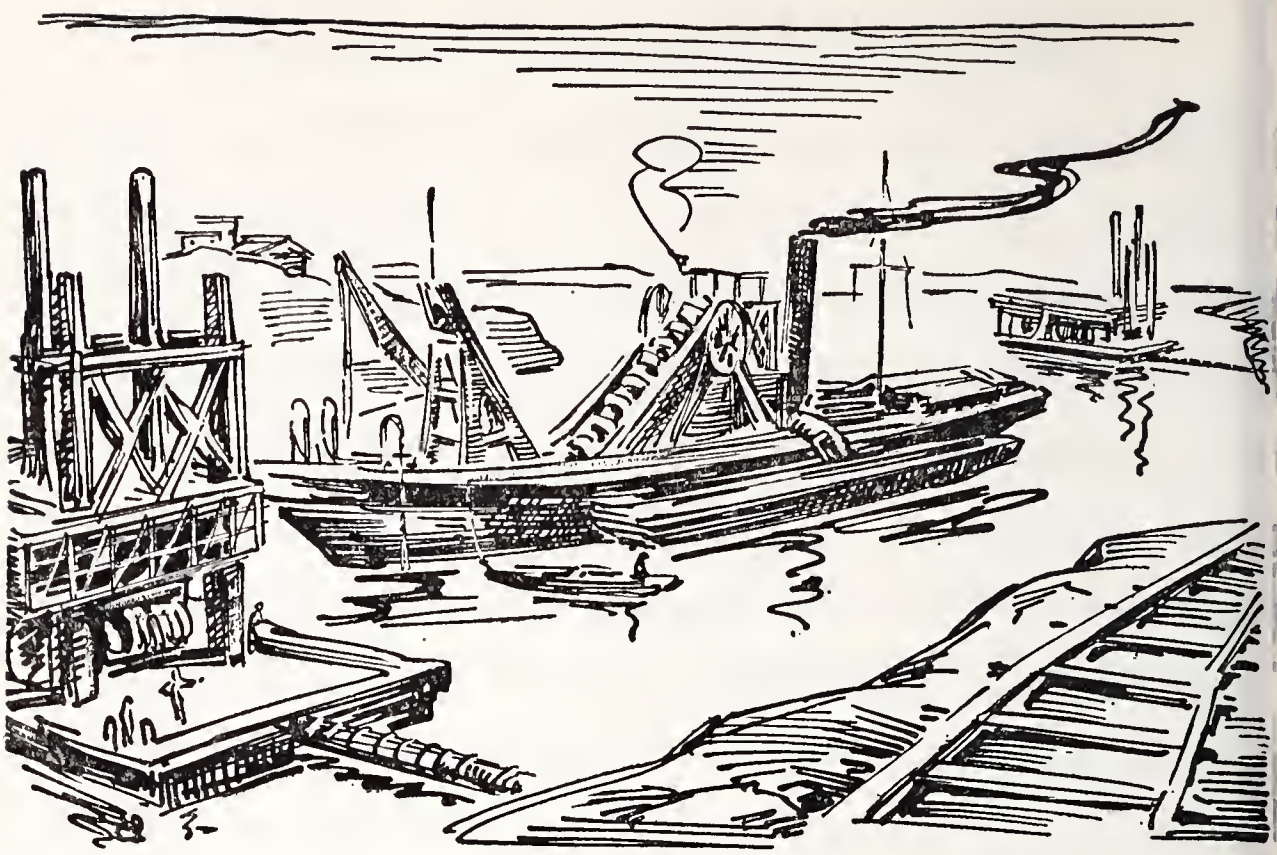
However, there was still work to be done. All the ancient, bitter resistance of the Isthmus seemingly gathered at Culebra. Slide after slide had broken the hearts of the excavators there. And only a few months before, close upon the time when the canal was scheduled to be opened, the greatest slide of all had come, the Cucaracha. That was when Goethals had said to the broken-hearted engineers:

"Dig it out!"

They had been digging for months, but the great mass of the Cucaracha still obstructed the Cut. Goethals decided that rather than put off the opening of the canal, he would let water into the Cut and attack what was left of the slide with dredges. So the water poured into Culebra, and hard on the water came the *Corozal,* the *Paraiso,* the *Gamboa*—the largest dredges in the world.

The *Corozal* was a twentieth-century giant, impassively powerful, another ship until her endless chain of buckets roared into life, and then capable of bringing up ten thousand tons of dirt and rock a day. The other dredges, with their fifteen-cubic-yard dippers, were only slightly less efficient. They steamed into the canal, right up to the Cucaracha Slide, where they were moored close together, boring into the mass of rubbery red clay day and night.

The dry-land diggers, the excavators and shovel men, stood around watching—curiously yet not without some



bitterness. Nothing that moved on land could measure up to these dredges when it came to excavation. The dry-land men felt that in some measure the canal had defeated them. Dredges would finish the job that should have rightly been theirs.

Day and night the dredges tore into the mass of the slide, eating it away, removing the final barrier that remained to navigation between the two oceans. As fast as the sluggish mass was excavated, it was loaded into barges and towed to a place where it might safely be dumped.

The last of the big slides was going.

Finally, by May 1914, a channel had been dug through the Cucaracha Slide, and barges were being towed from ocean to ocean. Thus, at long last, had man's dream come true.

Meanwhile, on our southern border, trouble was brew-

ing. The Atlantic Fleet had bombarded and occupied Veracruz in April, and a possibility of war between the United States and Mexico was being contemplated. Yet this war fever, this trembling uncertainty, was not confined to our southern border. The whole world was poised on the edge of a horrible chasm, and in 1914 the world toppled in.

An Austrian archduke was assassinated in the Balkans, and the First World War had begun.

Suddenly America realized that this new ditch, just dug by a man called Goethals, was its precious lifeline. Only as long as the canal remained open could our fleet, mighty as it was, operate in full strength in one ocean or the other. Destroy the canal and the fleet would have to divide itself into two more or less feeble parts, one half to protect the Atlantic coast and the other half to protect the Pacific coast.

Troops were rushed down to Panama, and the whole Zone was put on a war footing. Men thanked God for the long-range canal defenses set up by Goethals, and everyone spoke with pride of this new lifeline of America and its builder.

But its builder had other things to worry about. Six years of his life had gone into building the canal. Now there was only one question to be answered: Would it work?

Enough dirt had been removed from the Cucaracha

Slide to permit an ocean-going vessel to sail through the canal. The ship *Cristobal* of the Panama Railroad Steamship Line was chosen to make the first voyage on August 3, 1914.

For many years people had been looking forward to this occasion. It had been discussed and speculated upon endlessly. But now that the occasion had come, the world was taken up with other things, and the maiden voyage through the canal passed almost unnoticed.

As might have been expected, the trial voyage was none too smooth. Goethals' first anxiety arose at the Culebra Cut, where only enough excavation had been done by the dredges to give the ship bare clearance. However, it navigated the Cut successfully.

At the locks another difficulty arose. Goethals discovered that it would take months of practice before the canal men could expertly warp a ship through the big concrete basins. In the locks the ships were towed by locomotives, and on this maiden voyage one of two locomotives doing the job burned out its motor. Then a cable parted.

Goethals was in a cold sweat of doubt and worry. Everything seemed to be going wrong. Could it be that, after all their effort, the original plan of the canal had been faulty? Was this only the prelude to disgrace and failure?

Somehow the *Cristobal* made the passage from ocean

to ocean, and Goethals sighed with relief. It could be done. It was difficult and tricky and touchy, but it could be done.

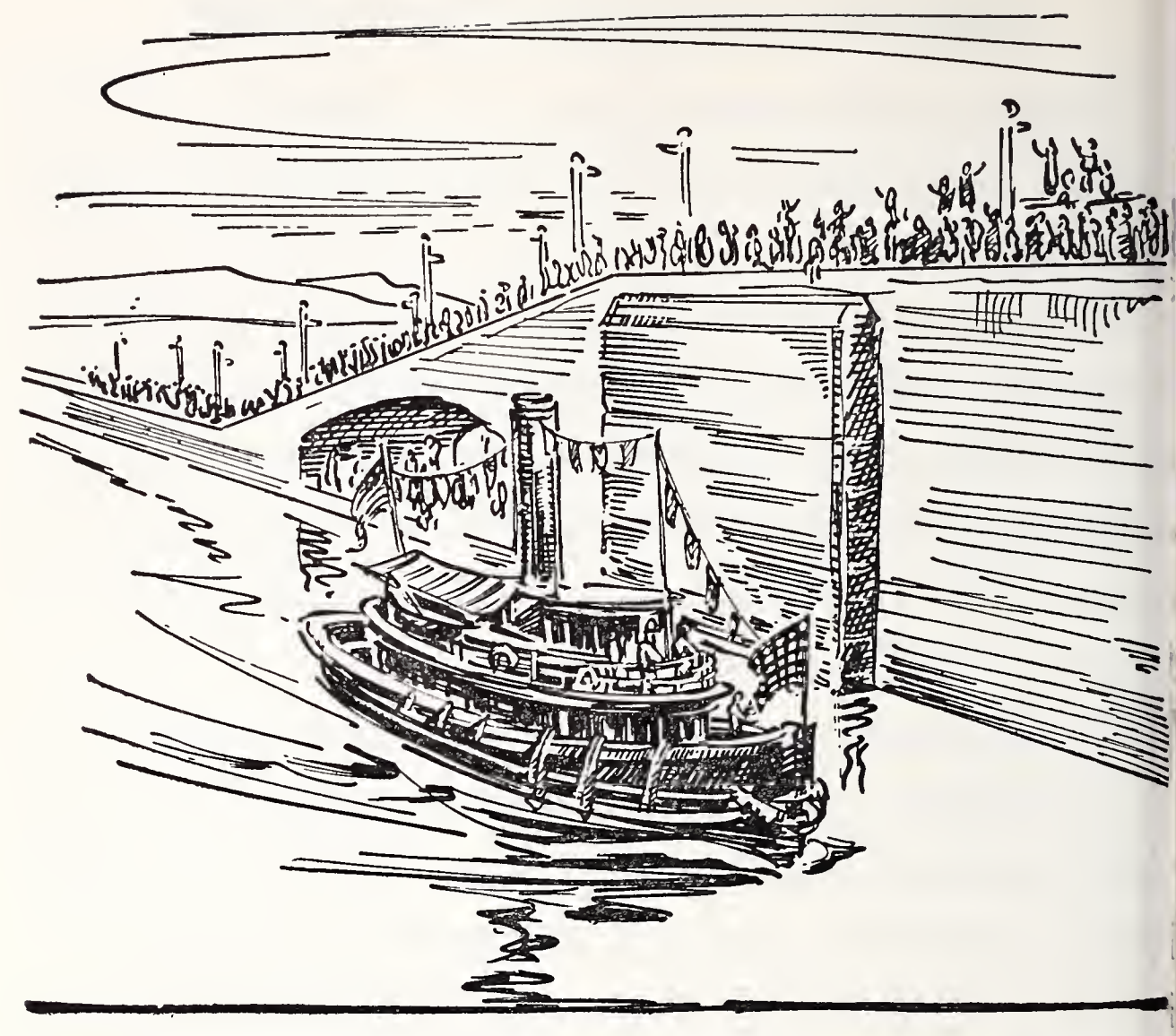
If it meant only practice and co-operation and expert teamwork, then he was determined to have all that. He would train crews for canal work the way a coach trains a football team. He would train men to warp a ship as easily as they operated steam shovels and dump cars. He knew it could be done.

He took two ships, the *Advance* and the *Panama,* and he used them to synchronize the work of the pilots and the locomotive men. A great weight was lifted from him when he saw both ships go through the canal smoothly.

Then, on Saturday, August 15, the canal was opened to the commerce of all nations. The *Ancon* was the first vessel to make the passage on this day. The *Ancon* was loaded high with canal men, Army officers, and officials of the Panama government. But even at this point Goethals could not trust himself to be a passenger on the ship. Instead, he mounted the old "Yellow Peril," and followed the boat through the canal, directing its movements and noting carefully how it was lifted and lowered through the locks.

The voyage was a complete success.

To the passengers on the vessel it seemed incredible that the canal had just been opened to navigation. The smoothness with which the locomotive teams worked, the



ease of the passage, and the manner in which the gates operated gave the impression of a system that had been working for many years.

To them it was a splendid success, and their congratulations fell thick and heavy upon Goethals. But the old canal men knew what had gone into the making of that quick, smooth passage. They saw the lines on the colonel's face that had not been there when he first came on the job. They knew what the tired smile on his face meant. They congratulated him, too, but there was a difference in their words. They had been on the job with him.

* * *

The continents had been torn apart. There was a westward passage. The commerce of the world streamed into the Panama Canal.

In the first year of its operation, twelve hundred and fifty-eight ships, carrying over five and a half million tons of cargo, passed through. In just the first year, tolls on canal traffic amounted to a little under five million dollars.

It was a success and it was a paying proposition.

* * *

As the years passed, the canal grew in importance. The First World War complicated the situation, but Goethals increased the defenses of the Canal Zone, turning the whole of the Isthmus into a vast fortress.

When a ship entered the canal, a Zone pilot took charge, and guards were placed on deck, in the hold, and in the engine room. Every precaution was taken against sabotage, and as a result the canal passed unscathed through all of that war.

Traffic through the canal increased constantly, and with the development of air power, new defense problems presented themselves. Today, the Panama Canal is the key of Western Hemisphere defense.

With the outbreak of the Second World War, it was realized that only a two-ocean navy could make America secure against aggression. But even with this navy, the

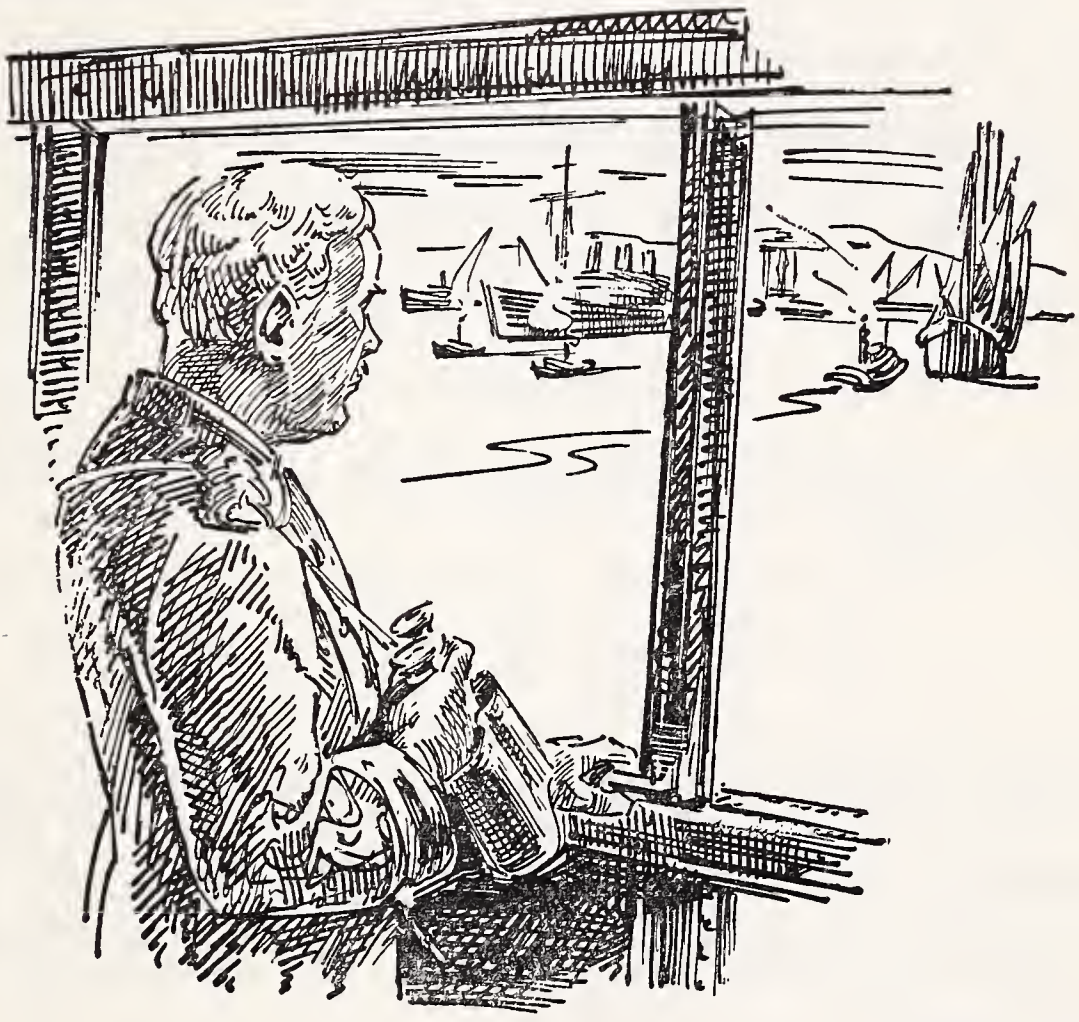
Panama Canal would remain a vital link in our defense structure.

For that reason, we are engaged in constructing a far-flung system of defenses to guard every possible approach to the canal. The Canal Zone itself has become a massive fortress outpost of the United States.

And still, with the world torn by war, ships move slowly and majestically and freely through "the big ditch," a lasting monument to the man who did the biggest job of his time.

CHAPTER ELEVEN

Goethals



THE END OF THE BIG JOB GAVE COLONEL GOETHALS A TEMporary letdown; it was much the feeling of a soldier, who, after spending years on the firing line, finds that peace has come, leaving him nothing to do and nowhere to go.

In addition, Goethals was faced with the worst task he had ever to perform, the breaking up of the huge canal force. They were a vast army of men, and for years they had been his comrades, sharing his tasks and trials, working alongside him. Yet they must go.

For so long the canal had been their life and home. They were of all ages and all races and all nations, but in their time at the canal they had shared one common purpose, to cleave the continents.

Now they had to be broken up, their purpose taken from them, sent back to the four corners of the earth. They wandered around the Zone aimlessly. They stared at one another curiously and with wonder. It was not the thing to ask what a chap had to do next; most of them didn't know.

* * *

When friends congratulated the colonel on his loyalty, remaining on the job to the very last minute, he growled:

"I'm not doing this because I want to, nor because I like it here."

Somehow he had never realized that the whole business would leave such a bitter taste in his mouth. The *job* had absorbed him so utterly that he had been unable to look ahead to a time when the canal would be completed.

Now it was done. He didn't want praise, and he didn't

want glory. It seems that he hardly knew what he wanted.

Perhaps the answer is that he wanted a job, a big job, a job up to his size. And it was his tragedy that no such job awaited him. He had successfully handled one of the biggest engineering projects the world had even seen, but it is not for us to say whether he should have been content.

He was growing old. His life had been a hard one, work and more work, with little rest. As with that old steam-shovel operator he had once advised, the world was going on, passing him for younger men.

* * *

He demanded gruffly that things at the Zone be changed as soon as possible from construction to operation. He could not go to the nation he had served and demand that they find places for the construction force, yet that was what he wanted most of all.

On January 27, 1914, President Wilson signed an order abolishing the old Panama Canal Commission; and thus, on the legal record of the United States, work on the canal came to an end. Two days later, President Wilson nominated George Washington Goethals for the first governor of the Panama Canal, and the Senate, eager to do the engineer honor, speedily confirmed the appointment.

There was one satirical note to this. For years, while engineers at home had been paid enormous salaries, Goethals had built the Panama Canal for the salary of fifteen thousand dollars a year. To be sure, this was in addition to his regular Army pay, but even the total amount was in no way comparable to the fees paid engineers in civilian life for work not so outstanding.

Now he was being honored and promoted, but his salary as governor of the Panama Canal would be only ten thousand dollars a year.

None of this had been done deliberately, but people everywhere took up the cry. Here was the way a great republic honored its faithful servants! Here was reward for effort! Only Goethals remained silent. He seemed to care nothing for money or rewards.

Offers came from everywhere. This firm or that firm wanted to employ him at his own price. Mayor Mitchel, of New York, wrote, asking Goethals to become police commissioner of the city. This was the saddest note, for at that time Tammany had New York firmly in its grasp, and the police department was shot through with corruption. To have accepted the job would have meant the speedy downfall of either Goethals or the police department, for the two of them could not have existed together at the same time.

Goethals answered that he was an officer on the active service list of his country. For him to resign from the

service was out of the question—as it always had been to a man of Goethals' mentality. And if, at some time, the President permitted him to retire, he would become police commissioner of New York only if he were allowed to remove any of his subordinates for unsatisfactory service.

That was the end of the matter. Goethals accepted the appointment as governor of the Panama Canal.

A signal honor was given to him on March 4, 1914. Then the Senate confirmed in open session the promotion of Goethals from colonel to major general. It was only the second time in the nation's history that such a confirmation had occurred in open session, the other case being that of General Grant.

The honors kept coming to General Goethals. He received the thanks of Congress.

A letter from Mr. E. V. Murphy, official reporter of the Senate, told him:

> True, there were confirmed the same morning the nominations of General Hodges, General Sibert, and General Gorgas, and a little later that of Rear Admiral Rousseau, but your confirmation came first; and so you have the unique distinction of not only being promoted two grades as a reward for your unexampled work as the builder of the greatest engineering project in the history of the world, but of the confirmation of promotion for the second time in our history in open legislative session of the Senate of the United States.

It is completely typical of Goethals that instead of taking unrestrained satisfaction in this fact, he was annoyed because he and other officers had been so signally honored while the civilian workers had been ignored. He pointed out that the contribution of the civilian workers had been just as great as that of the Army, that unlike the officers they had no pensions to which to look forward, and as a result of that they had been grossly neglected.

It seems that justice was an instinctive matter to him.

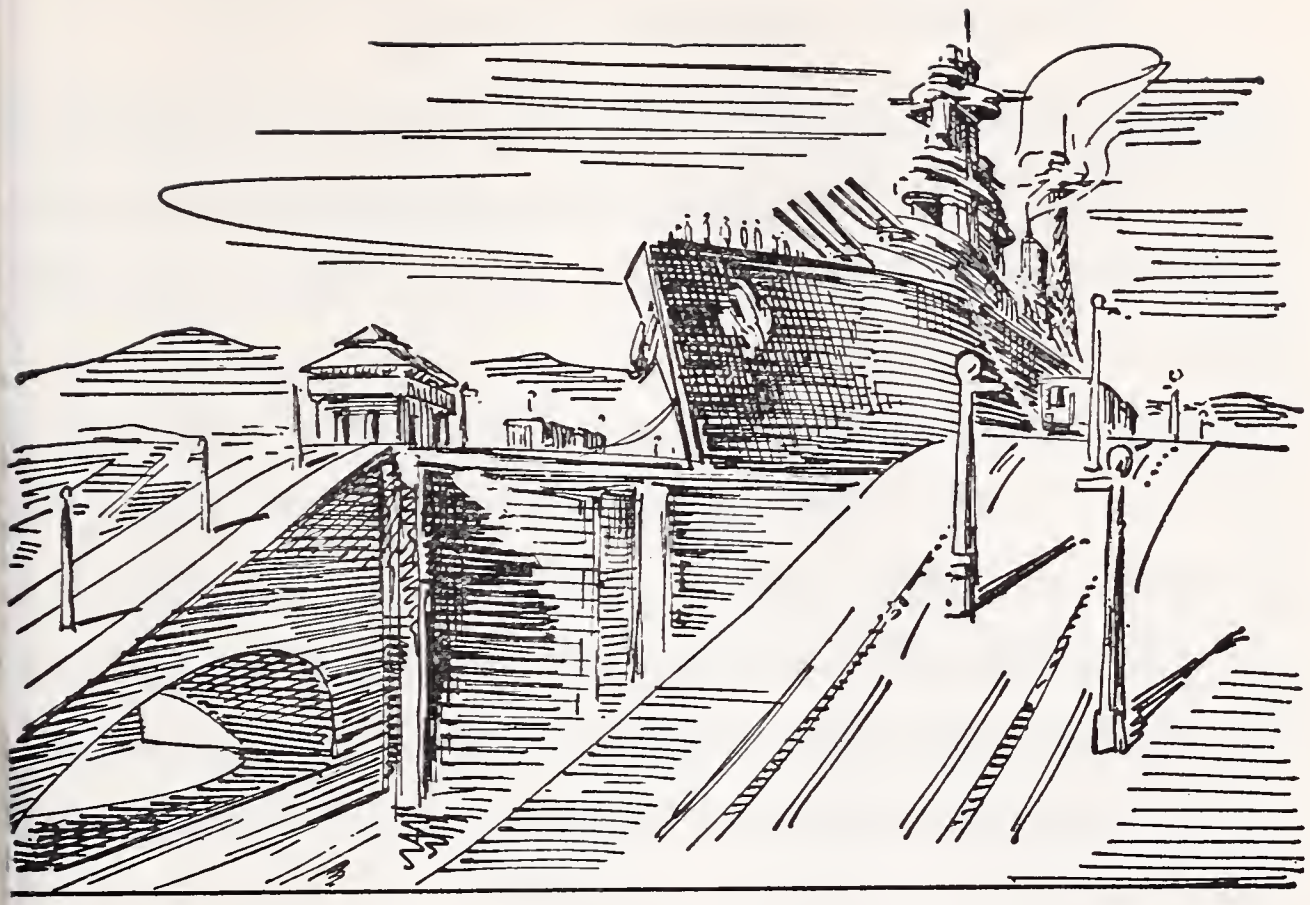
The two years at the Canal Zone passed quickly enough. For one thing, there was work in plenty to do, getting the lock crews to function smoothly, cleaning up the place, knocking out malaria and yellow fever once and for all, getting rid of the mountains of debris left by the construction gangs, and putting the defense works into order.

Also, the Cut, his old venomous enemy Culebra, did not give up so easily. Slides kept occurring, and each time they had to be dredged up in short order.

But he put things in place, and when his term of governor was over, the Canal Zone was working as smoothly as if it had been in operation for a hundred years.

* * *

It was September 1916, and Goethals was leaving the Isthmus for the last time. For so long, since 1907, it had



been his life. But the job was all done now, and he felt almost happy to get away.

On October 2 he landed in New York, and the first thing the reporters asked him was what he intended to do next.

"Look around for a job," Goethals answered.

Work was his life; he had to go on working or his life would lose its purpose. He had the driving intensity of a man who has deliberately chosen his life's work and followed it intently.

He had put in forty years of Army service, and he was now retired, free to look around and choose for himself. His decision was to go into private practice as a consulting engineer.

He was just a year less than sixty, but he could still feel a good deal of excitement about going into his own

business. He opened offices in New York, at 43 Exchange Place. George M. Wells joined him, and his old coworker, Sydney B. Williamson, came up from Chile to enter the firm.

At the same time, President Wilson had named him chairman of the new board, that had been created by Congress to report on the operation of the Adamson eight-hour law. He felt pleasure in being back in the driver's seat with some definite work in front of him.

At that time we were still at peace, but thoughtful men everywhere realized that we would soon be at war with Germany. They also felt certain that in such a case the first need of America would be ships and more ships.

Some men, believing that America could never build enough steel ships to supply Britain and France, devised a program of wooden-ship building. Others joined them, men whose interest was in selling timber, men who wanted the work of constructing these wooden ships.

One of the first things these interests did was to approach Goethals and ask him to assume charge of the whole project. Goethals was dubious. He could not see any reason, in a country that had built itself on steel, to return to the construction of wooden ships.

But somehow the wooden-ship question kept after Goethals. Mr. William Denman, a commissioner of the United States Shipping Board, believed that wooden ships could be built speedily and well; and he conceived

the idea of a bridge of wooden ships leading to France. He tried to make Goethals see the merits of his plan, but Goethals held firm to his conviction that wooden ships were not necessary. An offer of some fifty thousand dollars was made to Goethals to head a firm to build these ships, but Goethals rejected it.

When we entered the war, soon after this, Goethals was called on by President Wilson to supervise all emergency shipbuilding. Although Goethals had hoped to go overseas and serve in France, he could not reject this call from his President. He asked only one condition, that he have full charge. He was sick and tired of the claims of the wooden-ship builders. He felt that if he were given a free hand he could build out of steel all the ships needed.

During the time he was at the head of the shipbuilding project, Goethals did all he could, getting the work well under way and the keels of hundreds of ships laid. But all along it was a losing fight against the countless interests who desired not a bridge of ships, but profits and contracts. At last, when he was told that he would have to work under the Shipping Board, he felt that there was no other honorable course for him to pursue than to resign.

* * *

Goethals fretted and fumed. He was no longer young, but he desired with all his heart to serve his country some

way in this, her greatest effort. He offered his services to General Pershing, but he was refused.

It seemed to him that no one wanted a man who had fought all his battles in peace with steel and concrete as weapons. Yet he knew that he could apply to a battlefield the same qualities that had triumphed in Panama.

He went back to engineering, partner in a new firm. He made a study of needs and conditions in the port of New York. And then, unexpectedly, the call to service came.

* * *

At the end of 1917 the Army began to realize that the Quartermaster Department was in bad shape. They looked around for a man to take hold of things. They called Goethals.

He hadn't wanted this; desperately he desired to get across the ocean into France, into the thick of things. But now he was coming to realize that such a course would never be his lot. Even in the Army his service was behind the lines.

Years before, in 1898, the Quartermaster Department, because of its hopeless inefficiency, had contributed a great deal to the wild confusion of the war with Spain. Now, almost twenty years later, it was not much better off.

Goethals found that the department wanted leadership

badly. He found that within the Army various branches of the service were competing against one another, driving up prices on many materials. He decided to bring about some degree of co-ordination and consolidation in purchasing, and in this he succeeded.

Wilson had realized that Goethals would do a job only on condition that he were permitted to do it his own way. Now he gave the new quartermaster general full leeway to do as he pleased.

Goethals set about bringing order out of disorder. He found that the purchase of supplies was always behind the growth of the Army and the amount of supplies needed. He found that transportation was in a terrible tangle, that goods were being shipped pell-mell to the eastern seaboard, where no means of transporting them overseas or even of storing them was available. He found that ships were desperately needed, and he moved heaven and earth to get those ships.

Soon a steady stream of materials were flowing smoothly to France. It was due, in a large measure, to Goethals that the American soldiers in France had enough to eat, enough to wear. Just as he had succeeded in building the canal, he succeeded in this new job, the reorganization of the Quartermaster Department and the organization and operation of the Division of Purchase, Storage, and Traffic.

Governments and rulers were not slow to acknowledge

his services. America gave him the Distinguished Service Medal. King George of England made him an Honorary Knight Commander of the Most Distinguished Order of St. Michael and St. George. France made him a commander of the Legion of Honor, and the Chinese government granted him the Grand Cordon of the Order of the Striped Tiger.

When the war ended, he was conscious that he had done one more good-sized service for his country.

* * *

He was never in want of a job, but rather had to refuse them because of the misfortune of being only one man. He had to reject many of them because even his capacity for work was limited.

In 1917, just before he was called to Washington for shipping work, the governor of New Jersey had asked him to become state engineer to supervise highway construction. Goethals agreed, and even after he went to Washington, he continued to keep a hand in the New Jersey state-highway project. Goethals was one of the pioneers of the concrete highway, and he defended his stand there against all criticism. He insisted that the highway of the future would be a broad road of concrete, and he insisted that such roads, properly built, would last for years without cracking or heaving.

Events proved him right.

When Goethals got out of shipping, he began to look around again. A possible field of endeavor lay in the Wright-Martin Aircraft Corporation, where despite the necessity for turning out more planes and motors, something was holding them back. Goethals was asked to become president, and he agreed, provided he could have complete command. His proviso was accepted; he tackled the job, and in five months had production up and the plant running smoothly.

Other situations needed him. For many years the states of New York and New Jersey had bickered endlessly over the harbor that was the common possession of both. In 1916 things came to such a head that some solution had to be found immediately. The Interstate Commerce Commission recommended that the Port of New York be turned into one unit, with New York City and Hudson County co-operating amicably. Thus a joint Port and Harbor Development Commission was created, and one of their first acts was to choose Goethals for their chief engineer.

So finally, at long last, he was back home, serving the city of his birth.

It took him a long time to work out his Comprehensive Plan for the Port of New York, but afterward that plan became famous. He proceeded upon the simple principle

that it was better and more profitable for all the various enterprises of the Port of New York, the railroads, docks, wharves, ferries, to work together than for them to work against one another.

This Comprehensive Plan was adopted by the states of New York and New Jersey, and they entered into a compact out of which emerged the Port of New York Authority. The Port Authority was to have control of all the fifteen hundred square miles of the harbor and eight hundred miles of waterfront, altogether the busiest and most important industrial area in the world.

As to Goethals' work, it was enormous. Roads had to be built and improved. Bridges and tunnels had to be planned. Competing railroad companies had to be taught that it was to their benefit to work together; all the various methods of transportation had to be co-ordinated.

It was a big job, and big jobs were his close love. But it was not such a job as the canal. It was a job of consultation, not of doing, and with all his heart he longed to be doing.

What hurt him most as the years passed was to see how jobs were botched, how incompetents were put into positions of responsibility, how energies were wasted. He wanted another big job, another important job, a mammoth piece of work like the Panama Canal, but such a thing never came his way again.

One thing he did insist on, and from that principle he rarely departed. When he was on a job, he wanted to have the whole doing of it himself. If engineers were to work under him, then he wanted to appoint those engineers. If mistakes were to be made, he wanted to make them, and if responsibility had to be taken, then he wanted to take it.

Things came up, one thing after another, some large, some small. He had his hand in this and in that, but never in anything that was like the old days at the canal.

He had dreamed of a second Panama, hoped for one, but it was not to come.

* * *

His last job was in Florida, where he had signed an agreement to plan and supervise the construction of the new port of Palm Beach. He drew up plans for a very modern harbor. His mind was as quick, his hand as firm, as it had been years before. But hardly had the work gotten under way than Goethals became ill and had to return to New York.

He was having attacks of chills and fever. His doctor put him on a diet. He was told that he must take a rest, a good, long rest. That was hard treatment, severe punishment for the old veteran of the canal. He had never rested; he hardly understood the meaning of the word.

He went back to his old house at Martha's Vineyard, where he could sit on the porch and look out over the waters of the Sound. Thirty years before, the house had been built. He reflected upon what a long time that had been, what a full time.

He had his son and his grandchildren there, but he could not play with them as he would have liked to. His strength was failing. He had a good deal of lameness in his left thigh; his physician advised rest.

In September he returned to New York. Fever took hold of him again, but afterward he felt better. He met his two friends, Joseph Bishop and Sydney Williamson, at the University Club, where he had dinner with them. He did not know that it was to be the last dinner they would share.

Soon he could not even leave his room, and he reluctantly consented to a thorough medical examination. It was cancer. Only a few months remained.

He was told that an operation might prolong his life a few months, but he fiercely refused to submit to it. If he had to die, he would die working and fighting, as he had lived.

* * *

In a few months, on January 5, 1928, a group of old-timers were to sail for the canal. More than anything else Goethals wanted to go with them, to be back at the

Isthmus just once more with the friends he loved so well.

He worked to the end, completing, with the help of Joseph B. Bishop, an article on the canal, which he had promised for the fourteenth edition of the *Encyclopædia Britannica.* Then came realization that he would never make the trip to the Isthmus. With quiet dignity, he sent a brave and cheerful letter to the men who had gathered there.

He died at five minutes before twelve o'clock, on Saturday, January 21, 1928.

* * *

His monument is there, on the Isthmus, cleaving through the tall hills upon which Balboa stood, gazing upon the broad Pacific.

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